THE
MODERN CHURCHMAN

By identifying the new learning with heresy, you make orthodoxy synonymous with ignorance.—*Erasmus.*

A State without the means of change is without the means of its conservation.—*Edmund Burke.*

Nos. 5, 6, & 7. SEPTEMBER, 1924. Vol. XIV.

THE ELEVENTH ANNUAL CONFERENCE OF MODERN CHURCHMEN

By the Editor.

THE Scientific Approach to Religion was the subject selected for consideration at the eleventh Conference of Modern Churchmen held at Oxford on August 25th—31st. The order and titles of the papers ere as follows :—

Presidential Address by the Dean of St. Paul's; 'Evolution, a Vital henomenon,' by Professor MacBride, LL.D., F.R.S.; 'The Possibility Purpose,' by Rev. S. A. McDowall, M.A., B.D.; 'The Universe as vealed by Modern Astronomy,' by Rev. Hector Macpherson, Ph.D., R.A.S., F.R.S.E.; 'The Structure of Matter,' by W. J. R. Calvert, .A.; 'The Reign of Law,' by Rev. F. R. Tennant, D.D., B.Sc.; Biology and Religion,' by Professor J. S. Haldane, LL.D., F.R.S.; Autonomy of Life and Mind,' by Professor C. Lloyd Morgan, D.Sc., .R.S.; 'Immortality, Absolute or Conditional?' by J. E. Turner, M.A.; The Religious Consciousness in the light of the History of Religion,' by rofessor C. C. J. Webb, M.A.; 'The New Psychology and Religion,' Dr. J. A. Hadfield; 'Creative Prayer,' by Canon Streeter, D.D.; 'The atural and the Supernatural,' by Rev. C. F. Pussell, M.A.; 'The Miracu-us,' by Rev. J. C. Hardwick, M.A., B.Sc.; 'The Sacramental View of ature,' by Rev. Richard Hanson, B.D.; and two concluding sermons by anon E. W. Barnes, D.Sc., F.R.S. (Bishop-designate of Birmingham), nd Canon Glazebrook, D.D. These are all published in full in this issue the *Modern Churchman*, but in the case of some of the later papers not uite in the order of their delivery.

As the addresses, papers, and sermons are published in full, there is o need to attempt to summarize the teaching of the Conference. We ould venture, however, to direct attention by way of comment, if not of iticism, to several points which arose in connection with the discussion the papers, and to other points which might properly have been raised it were not.

Professor MacBride's Paper.

While the value of Professor MacBride's paper lies in his affirmation at evolution is an incontestable fact and that life is incapable of an lequate mechanistic interpretation, there are some who will feel less tisfied with the paper on its theological side. It is not exactly what

Professor MacBride says, but the hasty deductions which may be drawn from his statements, which will appear unsatisfactory.

It is certainly true, as Professor MacBride points out, that Science disposes of the historicity of the Fall Story in *Genesis*, in which St. Paul believed, but it does not dispose of the psychological truth of the teaching enshrined in that story. The doctrine which formal theology associated with original sin is not a state of primal innocence, as Professor MacBride seems to suppose, but a state of 'original righteousness.' It is certainly true that science disposes of the doctrine of original sin as inherited guilt, and also of orginal righteousness as a state antecedent to it. Science has shown us that what is popularly called 'original sin' (what, for instance, the poet Browning called 'original sin') consists of man's inheritance from his brute ancestry—'the ape and tiger' of Tennyson, and 'the primitive donkey' of Bishop Creighton, but Science has not demonstrated that there was no stage of primal innocence in human evolution and that the transition from that state to one of conscious guilt was not by means of a moral fall, the deliberate choosing of the lower path of self-gratification in opposition to the voice of conscience which demanded the treading of the higher path. We do not think Professor MacBride would deliberately dissent from this, although he might regard it as theological hair-splitting. Yet there are phrases in his paper which seem to contradict it. Of course Science has disposed altogether of primal Adam as the perfect man portrayed in Milton's *Paradise Lost* or as reflected in Dr. South's quaint dictum that 'Aristotle was but the rubbish of an Adam'; it has also disposed of the Pauline doctrine that death came into the world as the result of sin. Palaeontology shows us that death was in the world millions of years before there was sin in it. Of course Science has also disposed of such myths as that the pangs of childbirth and woman's subject condition in primitive society are due to the sin of Eve, but Science by showing that 'the stuff' of sin is to be found in man's brute ancestry does not dispose of a man's moral responsibility for his own sins nor of his responsibility as a social unit for the sin of society. Science gives us no reason for making light of sin, though Science may quite possibly lead us to revise our estimate of the comparative guilt of various kinds of sin, and it should certainly lead us to revise our Baptismal Service. Moreover, Science does not teach that man as the result of a *purely natural* process is becoming better than his ancestors. There is much truth in Goethe's saying that 'Mankind is for ever advancing, but man remains ever the same.' Each personality has to achieve its own salvation, and is responsible for it.

The Pauline doctrine of Divine election hardly receives justice from Professor MacBride. May not St. Paul's Divine election be analogous to biological selection, but in the psychological stage of evolution? Augustinian and Calvinistic expositions of Pauline teaching, which have passed into popular theology, are terrible travesties of it. The Pauline doctrine of election is not concerned primarily with election to everlasting life or everlasting death, but with selection for divine service in this world. We do not wish to offer facile or futile 'reconciliations between science and religion,' but we cannot but feel that St. Paul has not a little in common with the modern evolutionary view of the creative process. Surely we can hear a Christian evolutionist speaking in *Romans* viii, 18-23?

> 'I reckon that the sufferings of this present time are not worthy to be compared with the glory which shall be unveiled to us and in us. For the Creation with craning neck is eagerly looking forward to

catch a glimpse of the final end of the creative process, namely, the Sons of God. For the Creation was not subjected to futility willingly, but in hope by Him who subjected it that the Creation might be delivered from the thraldom of corruption and so attain to the glorious freedom of the children of God. For we know that the whole Creation groans together and travails together in birth-pangs until this present moment, and not only it, but we ourselves also who have the foretaste of the Divine Spirit, even we groan within ourselves waiting for the full privilege of Sonship which involves the redemption of our body.'[1]

We do not suppose that all that St. Paul wrote is good for all time. Some of it is the product of his age and has lost its value. Were St. Paul alive in this world to-day, he would doubtless jettison his Jewish mythology and eschatology, but there is a body of moral and spiritual truth in his teaching which is destined to endure. Matthew Arnold's prophecy with which he concludes, *St. Paul and Protestantism*, may yet be fulfilled:

> 'The doctrine of Paul will arise out of the tomb where for centuries it has lain covered: it will edify the Church of the future: it will have the consent of happier generations, the applause of less superstitious ages.'

Matthew Arnold knew the Pauline writings as few know them. Professor Percy Gardner has written of the book just cited:

> 'Strange to say, the best account of the Pauline theology known to me is still Matthew Arnold's, so greatly does insight surpass learning.'[2]

The real theological problem raised by Professor MacBride's terrible description of 'Nature red in tooth and claw,' which seems irreconcilable with belief in an omnipotent and loving Creator, was not properly discussed by the Conference. Mr. Macpherson warned the Conference, no doubt rightly, against the danger of losing faith in the Divine Power, To set up a weak, struggling, and possibly ultimately defeated Deity as the God of Christian worship, which seems to be a modern theological tendency in certain circles, is not one to which we ought to yield. Such a Being does not represent adequately the tremendous forces and infinite wisdom which are manifest in the creative process. On the other hand, there is the presence of evil in that process, especially in the form of terrible and undeserved suffering, which but ill accords with our ideas of a Righteous and All-Loving God Who is also Almighty. It is easy to say of the creative process that the end will justify the means, but have we any proof of this? It may be replied that we must trust our moral consciousness which compels us to hold that God can be nothing less than moral perfection, a Being of Perfect Love. But we must also be true to our rational consciousness, which shows us in that creative process much terrible suffering, which is morally undeserved inasmuch as many of the creatures which suffer have no moral consciousness; and although such suffering in their case does undoubtedly subserve and contribute to the evolutionary process as a whole whether physical, mental, moral, or spiritual, yet it does not contribute in the vast majority of cases to either the physical, mental, moral, or spiritual evolution of the individual which

[1] Some of the phrases in this translation are from Dr. Moffatt's version.
[2] *The Religious Experience of St. Paul* (1911), Preface p. vii.

suffers. In the case of human beings it is no doubt otherwise. This distinction is clearly expressed in the familiar lines of Sir Henry Taylor:

> 'Pain in man
> Bears the high mission of the flail and fan:
> In brutes 'tis purely piteous.'

Most of the suffering endured in the creative process is vicarious, the individual suffers for the general good, and especially for that future good—'the one far-off Divine event to which the whole creation moves,' in which event in all probability the non-human sufferer will not participate. But the problem of whether it is moral that one should suffer vicariously who receives no reward for his sufferings (although he does suffer for the benefit of his successors, and himself benefits by the sufferings of his predecessors) puzzles us. If the pleasure which the sufferer, animal or man, has in his existence be greater than the pain, it may be reasonably argued that his Creator is morally justified in bringing him into existence. If the Creator could not possibly achieve the aim of His creative process except by the presence of vicarious suffering in that process, and if that aim be perfectly good, it may be argued that the Creator is morally justified in creating. But in that case it must be concluded that the presence of suffering indicates a limitation (temporary undoubtedly and voluntarily accepted) in the Creator and requires a very different conception of creative power from that which the Jews held and which has passed thence into orthodox Christianity. The Biblical instantaneous fiat method of Creation must be abandoned by Christian teachers. Creation is a process of vast duration. It is still proceeding: 'My Father worketh hitherto and I work.' That its end will be perfectly good is an affirmation of faith, but that affirmation is supported by the augmentation of values which is already manifest in emergent evolution as we know it even now. We are grateful to Professor MacBride for his valuable paper; we are equally grateful to him that in the spirit of T. H. Huxley, whose chair he holds, he frankly pointed out difficulties for traditional Christian theology which our modern knowledge of the creative process entails. If we have seemed to offer any criticism of his theological statements, it is mainly by way of supplement, not confutation.

Dr. Tennant and Dr. Macan.

Dr. F. R. Tennant's paper on 'The Reign of Law' aroused more criticism than any other read at the Conference, although little was actually said at the session at which it was delivered. At a subsequent session Dr. R. W. Macan, sometime Master of University College, Oxford, in the discussion on Mr. Russell's and Mr Hardwick's papers dealt with the important issues raised by Dr. Tennant's paper. This criticism we have pressed Dr. Macan to put into writing, and he has permitted us to publish it here, although he regards it as 'much too compressed and perhaps magisterial, to do full justice to the subject and to the writer's appreciation of one side at least of Dr. Tennant's mind.'

Law and Laws.

There appears to me to be a failure to distinguish between 'law'—say, order, cosmos, uniformity (as explained below), and the supposed 'reign of'—particular 'laws,' *i.e.* (provisional) uniformities, in the particular sciences.

The ultimate question is not whether the sun will rise to-morrow simply *because* it has always risen: not even whether 'matter is indestructible,' or 'the amount of energy in the Universe is constant,' and so forth. The ultimate query is whether the world, nature, the Universe is a Cosmos, and therefore potentially knowable, or a chaos, and therefore unknowable.

The question therefore resolves itself into a theory of knowledge. Here it is enough to say that in order to be known, the world, or the data of experience, must submit to the conditions which the mind imposes. The mind can only 'know' the world and the world can only be known, as 'in time and space' and as a system of relations, the most important of which is the relation of 'cause and effect.' These are not mere results of empirical observation, but the 'universal and necessary' conditions of all observation, and the ultimate ground of the rationality and order of the Universe.

Incidentally be it observed that Dr. Tennant's derivation of law is incorrect and unhistorical. Law, *νόμος, δίκη* is originally 'Custom' and speaks in the Indicative not the Imperative. Science returns to the original meaning.

'Science' and 'Wisdom.'

Dr. Tennant appears to draw a distinction in kind between 'Scientific Knowledge' and 'Wisdom.' But, surely 'Science' is simply 'Reasoned Knowledge,' Knowledge which is able *λόγον διδόναι*, to give a good 'account' of itself. So far as anything corresponds to the distinction it is in the objects to which the mind is directed. Science, say for the moment, deals with Nature ('Natural Science'): 'Wisdom' deals with Man—at least with Man in the sphere, or field, of 'voluntary action,' the incalculable, or the less easily calculable department of life-phenomena. Here no doubt there is a real problem before us: whether human 'freedom' is compatible with 'the reign of law': whether voluntary action is 'uncaused,' or 'unreasoned' action. The point is hardly raised by Dr. Tennant, but it is involved in his argument. Let it suffice then to say here that the phenomena of voluntary action (1) are obviously subject to the conditions of time, space, and causality (even if the cause is an 'ideal'), and (2) take their place (once they occur) in the series, or the system of phenomena subject to 'secondary causation.' In other words, the Human Will is not 'freeer' than the Divine Will: and if the Freedom of the Divine Will is compatible with the Reign of Law in Nature—of which more anon—the freedom of the Human Will is also compatible therewith.

'Rational' and 'Reasonable.'

Dr. Tennant draws an apparently important distinction between these two terms, and what they stand for: but what is it worth? It may be convenient to describe Deists as 'rational' and Theists as 'reasonable': but it only means that Theists are more rational than Deists: that their theory of things—of God, Man, the World—is more adequate, better argued, more convincing, more scientific, more philosophic. To say (as Dr. Tennant does) that there is an a-logical element in 'Reason,' if it means that Reason is at all irrational, is to talk nonsense. If it only means that the Syllogism is not an organ of Discovery, it is beside the point. Discoveries are made by guessing: but they have to be verified, to be rationalized, before they can become either Science of Nature or Wisdom of Man. A 'reasonable' faith is a rational faith, a faith that can give a reason for itself, even if the reason does not amount to 'proof.' If, as Dr. Tennant seems to think, neither Science nor Religion can fully justify itself at the bar of reason, that would only prove that there is in them some other

element besides reason, and not that the reason in them was a-logical. He supplies this element, as faith, hope, sanguine expectation. All he should say then is that faith, etc. is a-logical.

'Necessity.'

Dr. Tennant makes great play with 'Necessity.' He thinks that there are many 'sorts,' or kinds, of necessity. So there are. But he does not appear to realize that a 'necessity' which is not absolute is no necessity at all. In other words though he classifies necessities by 'kinds' he argues as though they differed in degree. He takes what he calls 'logical' necessity as the highest necessity: other kinds of necessity are inferior brands: perhaps if pressed he would say that they are after all not necessities:—that the only necessity known to us is 'logical necessity' when one thing is implied by—implicit in—another, as the Conclusion is implicit in the Syllogism. Accordingly he complains that the men of Science have transferred necessity from Logic (the Syllogism) to Physics, etc. But I think he is in the wrong there. My complaint against men of Science would be that they are mere empiricists! They do not, at least *qua* 'Scientific' investigators, understand the conditions, logical or metaphysical, of their procedure and results—they do not (and need not, merely for their own proper purposes) get back to the 'First Principles' which alone can justify their confident generalizations. . . .' Now 'Causality' as a relation is an absolute Necessity for understanding phenomena: but it acts or holds good entirely within the phenomenal field, that is, the region of 'secondary' causes: the only region of human experience.

Facts and Brute Facts.

Dr. Tennant seems to think that there are two kinds of facts: facts and brute facts. But what is a brute fact? A figment—there is no such thing. Facts may, indeed, be 'events,' or they may be 'objects'—but neither is 'brute,' irrational, unreasonable: a fact is only a fact in relation to other facts—every fact, *qua* phenomenon, *qua* perceived, is already highly rationalized: a percept is (subject to my qualification *infra*) a concept; every dagger is a dagger of the mind—or it would not be perceived at all. Dr. Tennant's 'brute facts' are as much abstractions, unrealities, at one end of the scale as is Kant's *Ding an sich* at the other.

Dr. Tennant is not fair to Kant. I admit that Kant did not wholly free himself from 'Dogmatism': but his Dogmatism is not to be found in his demonstration, against Hume, of the Universality and Necessity of synthetic judgments *a priori* (which is wholly successful) but in his dragging in the superfluous Brute facts in the shape of the *Ding an sich*.

Incidentally, Dr. Tennant seems to think that an Electron is a 'concept.' The definition of an Electron would be a 'concept' just as the definition of God, and the definition of Man are concepts: but an Electron is itself a percept, potentially: *ex hypothesi* if we had strong enough organs of sense (or instruments) we could perceive it.

Nature.

Dr. Tennant is as nimble over 'Nature' as over everything else—Necessity, Reason, Cause, Fact, Science, Knowledge. You never can tell under which thimble the pea will be found. He admits, or recognises, 'Nature' as the sphere, or field, of Uniformities, nay more, of causal and 'necessary' uniformities—therefore, so far, a Cosmos, a system: but he refuses to identify 'Nature' with 'the Universe.'

Just as he has said that there is an a-logical element in Reason so (I think) he might say that there is an unnatural, or supernatural element—or rather perhaps region, department, in the Universe. It is here (I think) that we come to the fundamental fallacy in Dr. Tennant's disquisition, and to the point where (as I shall show) he involves himself in the clearest self-contradiction, or inconsistency. His point is that Nature, or the Universe, is a system, but not 'a closed system': that law reigns but that the reign of law is not absolute (not quite 'necessary'), but can be—and is—broken by God *ab extra*: in other words that 'Miracles' in the Thomist sense occur.' And he gives two illustrations of such 'interference': which prove the contrary.

Interference.

Is Nature, then, an open system to Religion—or, as I should prefer to say, to Theology—and a closed system to Science, and to Philosophy? Waiving the point, whether 'an open system' be not a contradiction in terms, like a circular square, I would say that for Philosophy the Universe must be a closed system, otherwise there might be more than one 'Universe,' which is absurd: but that for Science, or rather for the several sciences, it is possible in each case to work satisfactorily upon the assumption that Nature is 'a closed system' so far as the particular science in question is concerned: so Physics only requires Uniformities in the phenomena of Light, Heat, Electricity: Chemistry extends the 'closed system,' or we might say 'the systematic closure,' further: Biology adds a vast province to the closed system and even includes man, as organized matter, therein.

But what of Psychology? What of man's soul? Here, as already shown above, we come to close grips with our subject. Is man's Soul 'supernatural'? Is it outside the 'closed system' which we thought might be Universal? Empirically, indeed, psychological phenomena show endless Uniformities, and seem to exhibit 'law,' can be largely predicted, and are generally understood, whether by our 'Science' or by our 'Wisdom.' But metempirically? metaphysically?—Natural Science will never answer that question! You must go to Philosophy. Here I crave indulgence if I put the answer dogmatically!

Philosophy seeks and finds the One—a closed system—not necessarily a 'static' but necessarily a perfectly Cosmic, orderly, logical Universe. ἐν ἀρχῇ ἦν ὁ λόγος. But the Phenomena of the Universe, Nature, the realm of Uniformity—that is also from top to bottom, from A to Z, a realm of secondary Causality—nothing 'occurs' in Time, nothing takes place in Time and Space, for which there is not an antecedent 'cause' in the Order of Nature. Otherwise expressed, at any given moment the existing Order of Nature, the present system of phenomena (actual or potential) is the effect of the immediately antecedent condition of the Universe, and the cause of the universal condition immediately consequent. Where, then, is the possibility of 'Interference' *ab extra*? God and Man here, as Spirit, appear to be under the like Necessity: a change in the temporal and spatial order can only be effected in so far as spirit condescends to enter therein among the nexus of Secondary Causes. *Natura non vincitur nisi parendo.* Spirit must assume the form of a servant, if it is to produce any effect on the World-Order.

I will not now attempt to work out the full significance of this theorem: that would carry us far beyond the scope of Dr. Tennant's paper: but I may point out that the two illustrations which he supplies of Interference

ab extra seem to confirm the position just reached. In the first case, God is supposed (possibly in answer to prayer) to deflect the stream of events or molecules by exerting a force at right angles to its direction, and the result is not 'abnormal,' and excites no surprise in the mind of the observer. In the second case the change in the phenomenal world is brought about by human 'interference,' albeit the human action is undertaken in or under God, or the Spirit of God: and again, causes no surprise. I need not further now elaborate this critique. But I may, very shortly, mark (1) Dr. Tennant's admissions, which really riddle his dualistic conclusion, and might have led him to a theory more 'sweetly reasonable': and (2) Dr. Tennant's inconsistencies, or self-contradictions, which make his paper so terribly complicated and perplexing.

Dr. Tennant's Admissions.

(1) Dr. Tennant recognizes that to assert Secondary Causation throughout does not involve 'materialistic atheism,' but is consistent with Theism, or at any rate with 'Deism,' that is, with the Great First Cause, who makes the World, Nature, the Universe, sets it going, and leaves it alone *in saecula saeculorum.*

I have already attempted to show that we can assert secondary causation throughout, and yet come to a much more satisfactory, reasonable, rational and religious conclusion than that.

(2) Dr. Tennant expressly asserts that all the natural is in some senses supernatural. He specifies (1) origin, (2) instrumentality, (3) meaning. I am not quite sure what he exactly means by (2) and (3): but he adds that God is the Mind, or Spirit, which 'made' (1) 'law-abiding things' (*i.e.* Nature), and not only 'made' them, but 'inspires them with a perhaps increasing purpose, guides them, controls them'—Inspiration, Guidance, Control, Purpose, Development? If in all those senses the Natural is already Supernatural, is its supernatural quality or aspect enhanced by this queer 'Interference'? And what sort of a God is it that is controlling, guiding, inspiring, and also interfering?

Dr. Tennant's Inconsistencies.

Their name is legion! Or at least that is the impression which the perpetual 'hedging' in the paper gives a fairly intelligent reader, on a first, or even second, perusal. Three may be selected as samples: (1) Dr. Tennant makes 'laws of nature' human descriptions in one place: and in another opines that laws (of nature) may be imperative prescriptions of Nature. Personally I prefer the former alternative. (2) Dr. Tennant makes 'Necessity' a precondition of there being demonstrably certain and unconditional science: but elsewhere asserts that the reign of law is not a precondition of the possibility of experience. 'Unconditional Science' is to my mind nonsense: and I should perhaps attach a more precise meaning to 'demonstrably' than is intended. Let that pass. Dr. Tennant would perhaps say that Science implies 'Necessity,' but that 'unscientific experience' does not: and that there is no inconsistency. Well, then, there is false analysis, for all experience is conditioned by time, space, causality.

(3) Dr. Tennant polemises against the 'Descriptionist' School: but it in his own theory—so far as he has one—that the Laws of Nature are descriptive. It is, incidentally, right of any and all 'Laws,' which are merely the principles, or generalizations, of the several sciences—the Law of

Gravitation itself has an empirical taint, it is not possessed of Necessity. The only 'Necessary' judgments are the *a priori* Synthetic judgments, but they constitute the Cosmos.

We hope our readers will feel as grateful to Dr. Macan as we do for his critical analysis of Dr. Tennant's paper.

'Our Cosmical Cousins.'

Mr. Hector Macpherson in his astronomical paper hinted at the existence of 'cosmical cousins' and 'the likelihood that life has appeared in many different regions of the Stellar System.' Other astronomers have taken a similar view. M. Camille Flammarion wrote in 1911:

> 'Yes, life is universal and eternal, for time is one of its factors. Yesterday the moon, to-day the earth, to-morrow Jupiter. In space there are both cradles and tombs.'

It may be worth noting that our great English scientist Alfred Wallace, O.M., F.R.S., in his book, *Man's Place in the Universe*,* produced strong arguments for the Earth, incredible as at first sight it may seem, being the only habitable planet.

The New Psychology.

Colonel Francis Fremantle, M.D., M.P., in the discussion which followed Dr. Hadfield's lucid and arresting address voiced the view that inasmuch as the Freudian psycho-analysis is concerned mainly with pathological cases, it does not present a true picture of the psychology of the normal healthy human being. Many who have read the literature of the Freudian psycho-analysis and have also lived in healthy domestic and social conditions will feel the full force of Dr. Fremantle's contention, which is more than sustained by Dr. Wohlgemuth's recent work *A Critical Examination of Psycho-Analysis* (1923). It ought however to be added that there was nothing in Dr. Hadfield's address to the Conference which indicated that he accepts the repulsive absurdities of the method which Wohlgemuth condemns. Certainly those who believe that the New Psychology is hostile to the Christian Religion, would, after hearing Dr. Hadfield, carry away the impression that this is very far from being the case.

The Miraculous and its Mentality.

The Rev. J. C. Hardwick in his paper on 'The Miraculous' asserted that so long as the mentality which demands miracles exists miracles will be wrought. But the question behind this assertion, What is it that creates that mentality? he did not deal with. It seems to us that there are three factors in its creation. The first factor is the implied conviction that a Divine Revelation requires Divine attestation by means of miracles. How shall I know that a Divine Revelation is true? The traditionalist replies with Paley: 'By the supernatural character of the miracles wrought in attestation of it,' forgetting that Christ said in no spirit of approbation, 'Except ye see signs and wonders, ye will not believe.' The second factor is the general belief that the power to work miracles is a proof of personal holiness. Hence the Roman Church requires evidence of at least three miracles having been wrought by one whose name is put forward for canonization in that Church. St. John the Baptist who wrought no miracle

* Published by Chapman and Hall. (New ed. 1912).

would thus not have been eligible. The third factor is the belief that it is not in the natural that we most evidently see God operating and have the surest testimony of His Presence, but in the unnatural, abnormal, unaccountable, and mysterious. When however men come to recognise that not the miracles accompanying a revelation, but the appeal that the revelation itself makes to the rational, moral, and religious consciousness is the test of its truth; that evil men are just as capable or incapable of working miracles as good men: that we can, if we will but cultivate it (as did William Wordsworth), be as conscious of God's Presence, Inspiration, and Guidance in life, in all the creative processes by which we are surrounded and in which we share, as those who see God only through the chinks in His Universe, *i.e.* in inexplicable and cataclysmic happenings, the mentality which demands miracles will disappear.

Criticisms of the Conference.

Where exception has not been taken in certain Church circles to what was actually said at the Oxford Conference, exception has been taken to holding it at all. It is suggested that there was no need for it. This contention we believe to be absurd. Those who urge it can know very little of the mentality of large numbers of their fellow human beings. When Dean Inge in his Presidential Address spoke of the conflict between science and religion as an 'open sore' which poisoned the spiritual life of the civilized world, and the conflict as still a long way from being ended, he spoke of what is a painful and self-evident fact. It is most manifest in Latin Christianity, but it is evident enough in England and America and in our British Dominions. There is a general belief that Christianity is discredited by science. This belief is at least half true. Many of the doctrines of traditional, not essential, Christianity are discredited by science and must be frankly and quickly abandoned if the grievous weakness of the Church is to be healed. A conference like the Oxford Conference helps to heal the sore of the conflict and to render the issues clearer to both parties, and so indicates where concessions ought to be made. Benjamin Jowett in his introduction to the *Meno* looks forward to an age when 'all the branches of knowledge, whether relating to God, or man, or nature, will become the knowledge of "the revelation of a single science."' The Oxford Conference has done something to assist that unification.

There are others who have taken exception to the Conference on the ground that there is no need for Christian theologians to understand, assimilate, and utilize the researches of the scientists. The duty of the Christian teacher or the *ecclesia docens* is not to sit at the feet of the scientists but to sit at the feet of Christ. The *ecclesia docens* has received a deposit, and its duty is to guard and transmit this deposit intact. If the researches of the scientists harmonize with this deposit so much the better for the scientists; if they conflict, so much the worse for the scientists. The Church does not stand at the bar of science, but the scientists stand at the judgement seat of Christ. It is their business therefore to hear the Church. In the words of George Herbert: 'Judge not the preacher for he is thy judge.' This attitude is really that of the Islamic conqueror who burnt the great library of Alexandria and gave as his reason that if it contained what was in the Koran it was unnecessary, whereas if it conflicted with the Koran it was pernicious. Such an attitude is essentially obscurantist and foolish. Obscurantist, because it does not recognise that there is much truth in the world outside the Bible and the Christian Creeds, and that all truth

is one, and that each truth sheds light on other truths. Foolish, because it does not recognise that we can only teach people through what they know. Hence if a knowledge of science is steadily advancing and the scientific method of thinking is permeating all classes, it is most important that the teaching Church (*ecclesia docens*) should become the learning Church (*ecclesia discens*), that so it may gain the attention of the community by correlating the new truth with the old. We cannot disguise the fact that orthodox Christian teaching has united itself to much false science and false history, and it is by sitting at the feet of science, and not less at the feet of Christ, that the Church will recognise what is false in its dogmas, and will, hard and humiliating as it must seem to some, renounce its errors openly. Of course the believers in an infallible Church do not see this, but for those who believe in the Spirit of Truth which inspires the Church there is no difficulty in accepting this and acting accordingly. The Spirit of Christ is the greatest treasure the Christian Church possesses. It is a spirit of Truth and Love; and the Church ought to be most anxious to transmit it. This transmission is not accomplished either mechanically or magically, but through inspired personalities. Nietzsche did attack the Spirit of Christ, but the great scientists as a body have not done so. As Dr. Fosdick said lately: 'The real enemies of the Christian faith are not the evolutionary biologists, it is those who insist on setting up artificial adhesions between Christianity and out-grown scientific opinions and proclaim that we cannot have the one without the other.'*

There are other writers who have made facetious protests against the Oxford Conference on the ground that it was 'high-browed,' and so had nothing of value for 'the tinker and tailor and plumber.' This is either yielding to the lure of the irrational or else mere playing to the gallery. In any case it does grave injustice to the intelligence of our artizans, many of whom would take a real interest in the Christian Religion. The attitude of the intellectuals towards Christianity permeates in time all classes. As witness the footman who said to Voltaire's friend: 'Sir, although I am only a poor valet, you must not suppose that I have any more religion than my betters.' At present large numbers of our artizan population, who although less highly educated are not less intelligent than our academic and professional classes, are alienated from the Church. There are many reasons for this, moral, economic, social, political. But one of these is intellectual. The Church has been growing intellectually discredited and that mainly because of the conflict between our orthodox dogmatists and our scientists and historians and the refusal or hesitancy of the Church to abandon frankly discredited intellectual positions. There is no need for his salvation that the Christian believer should take First Class Honours in Science. The saving truths of religion and morality are few and simple. Nevertheless there is great need that the Church authorities should not, like the scribes of old, take away the Key of Knowledge and not only not enter into the Kingdom of Heaven themselves, but hinder the simple and the truth-loving from entering in. Such Christian scribes would do well to take the words of William Blake to heart:

> 'Can you think at all and not pronounce heartily that to labour in knowledge is to build up Jerusalem, and to despise knowledge is to despise Jerusalem and her builders?'

This does not differ in import from the Arab proverb, coined surely by a follower of Aristotle: 'The ink of science is more precious than the blood of martyrs.'

* Cited by Professor R. S. Lull in *Christianity and Modern Thought* (1924), p. 84.

The Approach of Science and Religion.

Modern Churchmen are deeply indebted to those scientists who accepted their invitation to read papers at the Oxford Conference. Scientists do not, we may well believe, feel altogether at home in assemblies of this kind. The clerical mind differs so widely from the scientific mind that it is something of an ordeal for a scientist to address clergymen especially on a theme in which differences have been so acute. The spirit of wise reverence and patient sympathy which characterised the scientist readers of papers was as impressive as it was attractive. But this was not unexpected. We cannot forget that British scientists have more than once of late years made serious efforts to bring science and religion into harmony and to induce English Christianity to express itself in such a way as to win rather than alienate the scientifically educated. Older men are grateful to the Scottish biologist, Professor Henry Drummond, for his beautiful books on religion, and not least for his volume entitled *The Ascent of Man.*

No one has tried to do more in recent years to bring Science and Religion together than Sir Oliver Lodge. In *Life and Matter* (1905) he discussed the scientific foundations of religion in reply to the materialistic monism of Haeckel. In *The Substance of Faith allied with Science* (1907) he produced a catechism for parents and teachers. And this year he has returned to the same theme in *Making of Man* (1924). The last book written by Silvanus P. Thompson, D.Sc., F.R.S., *A Not Impossible Religion,* published in 1918, was a plea for a truthful religion, which although it may not claim to unravel all mysteries and to possess all knowledge yet is ready in response to the call of the Spirit of Truth to abandon outworn and misleading formularies.

Our Next Conference.

Mr. Hanson in the concluding Conference paper told his auditors that 'Reasonable men of all parties are agreed that some kind of re-statement, or at least re-presentation, of the essentials of Christianity is a vital need of our age,' and he added: 'There is nothing new or alarming in this.' We hope the *Tablet* and *Church Times* will note this last remark and spare the feelings of the weaker brethren among their readers when we hold our next Conference. If there is to be profitable re-statement there must not only be laborious research and clear thought but also courageous speech. Misrepresentation, especially alarmist misrepresentation, is as detrimental to re-presentation as sympathetic criticism would be helpful to it. The subject of the Modern Churchmen's Conference for 1925 is 'The Faith of a Modern Churchman.' This will enable us to deal with subjects to which those treated in this number of the *Modern Churchman* are needful preliminaries.

PRESIDENTIAL ADDRESS

By the Very Rev. W. R. Inge, D.D., C.V.O., F.B.A., Dean of St. Paul's.

IT is my honourable duty and privilege to give the opening address in a Conference which, I hope and expect, will be the most interesting and important that our Society has ever held. But before I proceed to the subject of our debates, the Scientific Approach to Religion, I must take leave to say a few words, *in piam memoriam*, about my dear old friend the late Dean of Carlisle, who, if he had been spared to us, would be addressing you as your President this evening.

Dr. Rashdall was one of the most learned men and one of the deepest thinkers in the Church of England. The range of his interests was astonishing. As a medievalist, he was the author of a great history of the Universities of the Middle Ages, which is not likely to be superseded. As a student of the history of dogma, he wrote a very fine survey of the doctrine of the Atonement. As a moral philosopher his work was in the first rank. Personally, I have sometimes wished that he had concentrated on a detailed study of Christian ethics; I believe he could have done this work better than anyone else, at least in this country. His sermons and addresses, though not exactly eloquent, were full of valuable matter, better perhaps to read and read again than to listen to. In conversation he was a keen but always good-tempered controversialist, with a Socratic love of disputation; his philosophy-pupils at Oxford found him a most stimulating teacher. His generosity and genuine goodness were known to all his friends. Oxford was the loser by not making him a professor, a position which he would have liked. The fact is that he had about equal claims to hold a chair of theology or of philosophy or of medieval history; his versatility may have stood in his way. He will long be remembered as one of the most distinguished leaders of the Anglican Church in our time, and we of the Churchmen's Union shall always be proud of his all too short tenure of the office of President.

The conflict of Science and Religion is still a long way from being reconciled. It is an open sore which poisons the spiritual life of the civilized world. It is difficult for a man to accept orthodox Christianity as the Churches present it to him without treachery to his scientific conscience. The injury thus inflicted upon religion can hardly be measured. Intellectual honesty is, to a large extent, strained out of the Church, and public opinion within it does not reflect either the best knowledge or the most candid temper of the community. Our Society exists to deal with this lamentable state of things. It it too big a problem for us to solve, but we may do something towards its solution, and we must do all we can.

The problem is as old as the beginning of unfettered thought. Philosophy, which is the complete honesty of the intellect with itself, began in Ionia with purely theoretical interest, independent of the popular religious cults. It is significant that in the whole of classical literature there has survived no work by a priest, unless indeed we remember that Julius Caesar, a notorious agnostic, was supreme pontiff! But in the later period philosophy gradually passed under the power of practical human needs. In the post-Aristotelian schools philosophy became more and more a rule of life, a refuge for the individual from a hostile world, and at last a spiritual religion. Scientific investigations decayed, and while they were in abeyance something like a synthesis of faith and reason was effected by the Neoplatonists and the Christians who carried off their honey to their hives. The schoolmen of the thirteenth century effected another reconciliation, but still more decidedly with science left out, and with philosophy in fetters as the *ancilla theologiae*. At the Renaissance nature-study again asserted itself; but the Church felt too strong to make concessions, and so science, from Copernicus and Galileo downwards, found itself in continual conflict, not with Christianity, but with blocks of antiquated physics and astronomy which had been used to build up the fabric of dogmatic theology. As knowledge increased, the cleft between science and tradition became wider, till the two confronted each other as irreconcilable enemies. Philosophy, of course, ought to have been the mediator, and to some extent was so; but philosophy itself was

involved in the dualism. For example, Descartes and many of his successors maintained that thought functions quite independently of the brain, and *therefore* reveals the independently real. This dualism of the sensuous and the conceptual had a long and unfortunate dominance.

Since Kant, the idea of *value* has been fundamental, and the conception of intrinsic value dominates the whole conflict between idealism and naturalism. But Kant, though he subordinates 'the frame of nature' to the realm of ends, built up by the good will as the absolute value, nevertheless makes values rest on subjective conviction, while 'knowledge' is only of forms. Even Lotze says: 'To our human reason a chasm that cannot be filled, or that has not been filled, divides the world of values from the world of forms. With the firmest conviction of the undivided unity of the two we combine the belief in the impossibility of this unity being known.' Unfortunately, we have to unify them somehow, if we are to live rationally. Dualism is never more than a half-way house. The unity of our own personality compels us to adopt some kind of monistic theory.

The philosophy of Spencer, Huxley, and others in their time was a queer blend of subjectivism and mechanicism. The two would never combine. Either the agnostic subjectivism dropped out, leaving dogmatic materialism, with a floating haze of inert 'epiphenomenal' mind-products hovering over it, or the Unknowable insensibly took to itself attributes, and became the supreme object of mystical contemplation. This may be said to have happened both to Spencer's Unknowable and to Hartmann's Unconscious. They both point, strangely, towards Neoplatonic mysticism.

It is worth noticing that even science, apparently so detached from practical interests and political aspirations, has been deeply coloured by the prevailing ideas of the time. Lamarckism seems the most appropriate natural philosophy for a generation which proclaimed the *carrière ouverte aux talents*—the age when every French soldier was said to carry a field-marshal's bâton in his knapsack. The doctrine of natural selection belonged to the age of unchecked industrial competition, when the devil, or the workhouse, was waiting to

take the hindmost. To-day the tendency, outside science, is towards an anarchical universe and free experiment. In science this is reflected in the revolt of biology and psychology against mechanism, in the repudiation of determinism, and in a widespread reaction against the favourite scientific theories of the last century, including even Darwinism. It is very difficult to be unbiassed by the ideas which are swaying the minds of our contemporaries.

This reaction against naturalism or mechanism, even within the ranks of natural science, is one of the most remarkable phenomena of the day, but its importance is very difficult to gauge. Aliotta has reviewed all the forces of the coalition in his *Idealistic Reaction against Science*. Feeling, will, imagination—every obscure and primitive instinct—have invaded the temple of Reason. Discredited superstitions—theosophy, necromancy, spiritualism—have lifted up their heads again. A Neo-Catholicism which prides itself in believing in all kinds of miracles, ancient and modern, has sprung up, and flouts the idea of uniform natural laws. It seems sometimes as if we were reverting to a pre-scientific age. The French philosophers, Bergson, Le Roy, Boutroux, etc., try to prove that there is nothing objective in facts, laws, or scientific theories. Paulsen, late professor of philosophy at Berlin, declared that 'Science, by reason of its poor practical results, must be looked upon as a thing of the past; the future lies open to faith.' The Pragmatists give us leave to believe what we choose, at our own risk.

If these attacks were confined to metaphysicians, science would perhaps ignore them. But disintegration is in progress from within. The aim of nineteenth century natural philosophy was to reduce all qualitative change to quantitative; to find the simplest possible unitary formulas under which everything in the universe could be brought. Hence the priority given to mathematics and physics as the type of pure scientific method. Teleology was displaced by the theory of blind invariable sequence, wrongly called causation, and every tree was to be known by its roots, not by its fruits. Mind must be made commensurable with matter; and as no mode of measuring thought can be found, mind was practically banished out of the scheme.

gainst this reduction of mind to body, of life to the inanimate, psychology to physiology, biologists and psychologists now ike revolt. They point out that this theory is not pure ience, but a jejune and abstract philosophy built upon mathe- atics and physics. Those who wish to maintain the supre- acy of the spiritual—of all that religion stands for—have ways felt, and rightly, that they cannot come to terms with is purely quantitative method. All the imponderables, which e the most real things in the world, slip through its meshes nd are lost.

The present wave of irrationalism is best regarded as a eaction against an inadequate theory of the universe. These ovements and counter-movements, both pushed to extremes, e no new thing in the history of thought. The Sophists pposed an antinomian subjectivism to the intellectualism of ie pre-Socratic philosophy. Tertullian set his '*credibile est uia absurdum*' against the rationalistic mysticism of Alexan- ria. Among the schoolmen, Duns Scotus maintained that *Voluntas imperans intellectui est causa superior respectu ctus eius*,' against the '*simpliciter intellectus est nobilior quam oluntas*' of Thomas Aquinas. After Ockham's scepticism ame a revival of Neoplatonic metaphysics in Eckhart. pinoza attempted to interpret even the moral life '*more geo- etrico*'; and we see the reaction in aestheticists like Shaftes- ury. Hegel and Schopenhauer were at open war in the same niversity. The victory of materialism and mechanism seemed be complete in the middle of the nineteenth century; but the iumph was short.

Spencer's psychology of biological adaptation prepared e way for reaction. May not all our scientific beliefs be, like ir sensations, merely adaptations to environment? Have they ıy validity except in helping us to live? It further became ain that the two theories of mechanism and of evolution are compatible. Mechanism contradicts the fact of change. A achine can generate nothing new. This difficulty was dis- uised by postulating only very small and gradual evolutionary anges, a defence which to a philosopher was as absurd as the ology of the servant girl for a baby whose appearance needed ology, that it was a very small one. Change is change,

whether it is rapid or slow, and it is very difficult to account for on the hypothesis of naturalism. Only the permanent can change; and naturalism has no place for permanence.

Before the end of the century, the Darwinian doctrine of natural selection was hotly assailed; and Weismann's dogma that acquired characteristics are never inherited has been continually called in question; nor do the heretics show any sign of being driven from the field. And observe that all the anti-Darwinian theories are teleological. There has been a distinct reaction towards the speculations of Lamarck, modified, of course, by later knowledge. De Vries' theory of saltatory mutations gives an alternative explanation of the origin of new species, and one which pleases the revolutionary optimism of the day. Many are willing to postulate 'direct psychical factors' in physical changes. There is, they say, a tendency to progress innate in the organism itself.

In my opinion the dispute about teleology is a dispute about nature's *methods*; I do not think religion is vitally concerned in it. It is a quarrel between two scientific theories, the Aristotelian entelechies and natural selection. The theory of final causes, it has been pointed out, is an *asylum ignorantiae*; it states the problem without explaining it.

But this last objection will carry us far. Some have said that all science is merely descriptive; that it explains nothing. Scientific laws are not forces or causes. When science boasts that it has explained a phenomenon, it generally means only that it has reduced it to a simpler principle. But even if it reached its ideal consummation, and found a unitary formula under which everything could be brought, the evolution of heterogeneity and diversity from unity would still remain a mystery. Attraction and repulsion are metaphors which explain nothing.

It may be answered that the search for general laws is not merely descriptive. The answer is true; but it leads us rather further than some naturalists would wish to go. The search for general laws is not merely descriptive, because it is a search for *values*. And here I think we come to grips with the dualistic theories of mind and matter which we have already touched upon.

Valuation is as much a fact of our nature as sense-perception, and cannot be separated from it. If we think the matter out, there is no fact without a value, and no value that is not a fact. All that we perceive, we perceive as having value. Unity and conformity to law are part of one of the ultimate values, inherent as ideals in our minds. The statement sometimes made that science observes facts without valuing them is untrue, and it introduces great difficulties into philosophy, because it seems to justify the error that it is possible to build up a world by purely quantitative standards. All knowledge is of the *quality* of existents. But judgments of quality are related to universal standards which are part of the texture of the mind. I think it very important to insist that the world as known to science is just as much a kingdom of values as the world known to religion. The difficulty is that the values are not the same.

I shall assume as proved that there are three ultimate values and three only—goodness, truth, and beauty. I will quote in support of this two passages, from philosophers who are not at all in close agreement—Bradley and Windelband. Bradley says: 'Goodness, beauty and truth are all there is which in the world is real. Their reality, appearing amid chance and change, is beyond these, and eternal. But in whatever world they appear, that world so far is real.' And Windelband: 'Logical, ethical and aesthetic values make up the entire range of the human value-activity which can lay claim to general recognition and the necessity of actual unconditionedness. In each of these provinces the valuation of the empirical mind has a significance which transcends the mind itself. . . In its metaphysical significance it is a rational community of spiritual primary reality that transcends all experience. There can be, as regards content, no further universal values beyond these three, because in these the entire province of psychic activity is exhausted.'

These three, then, goodness, truth and beauty—the order in which we put them is immaterial, since they are a triple star, or three sisters, 'never to be sundered without tears,' as Tennyson says, but never to be fused or subordinated one to another—these three are the attributes under which we know God and the

world. What we call the ideal is the presence of God in the soul. We are closest to true knowledge when we can see and feel these attributes of God without us and within.

It is, no doubt, extremely difficult to harmonise the thought of the world as a kingdom of values with the thought of the world as an assemblage of things. The difficulty is proved by the failure of one philosophy after another to preserve them both. Either the kingdom of values fades into a dream of unfulfilled ideals, the realm of that which ought to be but is not, or the world of things evaporates into mere appearance.

But we cannot be satisfied with either of these attempts to get rid of the dualism. The ultimate values must be supremely real. If there is no absolute reality, there can be no philosophy, and no relativity, since relativity depends on a background which is unconditioned. The existence of an eternal spiritual world is rigorously involved in the nature of valuation, as soon as we rise above individual and historical relativity. And it is demanded by an experience which is as real as any other. Religion especially demands that the object of its adoration shall be conceived as a living Power, existing eternally, independent of time, in its own right. On the other hand, all subjective idealism is wrecked on the fact that our consciousness asserts positively that the objects of sense, however much they may be transformed in passing through our minds, are themselves non-mental. If we cannot trust this testimony, it seems to me that we can trust nothing.

It is worth while to remind ourselves, as against Voluntarists and Pragmatists, that there are values which are free from desire and expectation. It is here especially that we encounter intrinsic and absolute value. Such are the aesthetic values, and, as Schopenhauer rightly added, those of science no less than those of art.

The place of religion, art, and intellectual activity in any comprehensive view of reality is therefore much more secure than that which the thinly disguised materialism of the nineteenth century allowed to them. A scheme which leaves out the ultimate values is even ludicrously inadequate; it is fatal to science itself. The division of reality into the purely mental and the purely mechanical leaves nothing on either side of the line. Equally fallacious, I believe, is the separation of

primary and secondary qualities, which has the support of many notable names. But I have not time to discuss this point.

The impossibility of making a coherent and intelligible world out of naturalism is disguised by the tendency of naturalism in practice to develop into pantheism. It may even become devout while reflecting on the Divine immanence. But this poetical, mystical, half-animistic naturalism, which bears witness to the impossibility of keeping out the absolute values which are implicit in science itself, or at least in the mind of the scientist, does not satisfy the devotees of mechanism, whose object, as I have said before, is to reduce everything to quantitative measures, such as it finds in physics and chemistry. Mechanism decked out with animistic ideas may be an attractive creed for the unthinking, but it is a patchwork of two incompatible theories.

Let us next enquire what are the minimal demands which religion makes. It demands a meaning and purpose in the world-process; or perhaps it would be content with an infinite number of finite purposes, since it is not bound up with the theory that history has a beginning, middle and end. But it insists that its values are being actualised, imperfectly no doubt, in time. Next, it demands that the whole world shall depend on a power above the world. The notion of a God who is realising Himself in the time process, an imperfect God who is only coming by degrees into His own, is not and never can be satisfactory to the religious mind. The God of religion must be transcendent. That this, the theistic hypothesis, is more difficult to accept than, for example, the Hegelian deity, I cannot agree. Theism seems to me to be beset with fewer difficulties than any other creed. Perhaps we ought to add a third claim of religion which has lately been emphasised in Germany by Heiler and especially by Otto, that room must be found for the conception of the *Holy*. The awe, reverence, and attraction which the soul feels for the supreme mystery behind existence, is, as Otto says, an irreducible factor in human experience; it is the source of the devotional life. A Frenchman has said, 'Un Dieu défini est un Dieu fini.' We should instinctively distrust a theory which accounted for everything without remainder. '*Omnia exeunt in mysterium.*' Otto partly spoils a valuable argument by speaking repeatedly

of this specifically religious consciousness as 'irrational.' It is not irrational, because there is a sound reason for distrusting a theory which explains everything perfectly from imperfect premises. Otto is really justifying mysticism, which can give a very good account of itself on rational or intellectual grounds, as Plotinus proved once for all.

The origin of the psychical is hidden from us, but it is never really a function of bodily development, and as it grows, it becomes more independent, and seems to breathe naturally in the atmosphere of the spiritual world. Here again we are on the bedrock of experience, and it is safest on the whole to believe that the experience of the divine is actually what it thinks itself to be.

There can be no treaty between religion and science to leave each other alone. The world as known to science is no doubt 'appearance,' not 'reality.' This means in the first place that, as judged by the triumvirate of the absolute values, it is defective. It does not include or account for all relevant facts. Secondly, we know that science has to make its synthesis from very inadequate physical data. We see only a few colours; we hear only a few sounds, and so on. Thirdly, we do not get our idea of natural law from nature, but we find it reflected in nature. But nevertheless, 'the shadow is a true shadow, as the substance is a true substance.' And I have already shown that the world of science is itself a kingdom of values. For this reason, if we try to construct a religion without reference to what we know of the behaviour of nature, or in contradiction of what we know of that behaviour, our religion will be fatally impoverished or distorted.

And if idealism without science is mutilated, science without idealism is involved in insoluble difficulties. We need only point to the familiar antinomies of time and space. Are they infinite or are they not? The two alternatives are perhaps equally demonstrable and equally refutable. Personally, I incline to the belief that time and space have no beginning and no end. Neither time nor space, I believe, belongs to the eternal world, but the physical world is perpetual, as God is eternal, boundless, as God is infinite. But religion is not vitally concerned in this problem. A similar difficulty besets science in the law of 'entropy,' which demonstrates that the

Universe is running down like a clock. This alarming prospect really points to a Creator; for if the universe is running down, why did it not stop long ago? It must have been wound up at some particular date, and whatever power wound it up once may presumably wind it up again.

We of the Churchmen's Union come into conflict with traditionalism chiefly on the question of miracle, and this for many is the meaning of the conflict between religion and science. A few remarks on this subject will therefore not be out of place.

It might seem easy at first sight to distinguish between myth or legend, and their spiritual and moral content. But every form of religion involves a theory of the universe, which seeks to account for all facts relevant to religion, from whatever source they are derived. Supernaturalism, the theory of occasional divine intervention, is a very old method of dovetailing the spiritual into the natural, and so preserving both. The religious motive is to find in experience three things which it values—evidence of divine providence, of the dependence of the natural order on the will of God, and of the mysteriousness which, as we have seen already, is part of the demand of religion. The error, as it seems to modern thinkers, is to seek this evidence in isolated and exceptional acts, as if there were two forces at work, nature and super-nature. This theory would obviously reduce all the sciences to chaos, and all the sciences are agreed in rejecting it. On the other side, we may perhaps suggest that science has not shown how change can come about except by a sort of normalised miracle. It would not be true to say that belief in miracle reduces the *world* to chaos, though it would throw the natural sciences into confusion. On the contrary, miracle postulates that nature is thoroughly explicable. Laws must exist and be known before we can declare that they have been broken. But the prestige of natural law, or rather of uniformity of sequence, is a comparatively recent thing; in the pre-scientific ages it was much easier to believe that the laws of nature had been suspended, and such alleged breaches were accepted as fairly common occurrences.

We must, however, admit that the miraculous is welcome to some minds because they dislike law and order. They would

prefer to live in a world where statues may conceivably wink, houses fly, and cripples suddenly walk. Such a world might be more exciting than the world as known to science, but I think it is a mistake to suppose that it would be brought more easily under the religious point of view. An irregular world would not really be more 'dependent.' On the contrary, I suggest that only a cosmos which seems to be sufficient to itself can be conceived of as having been created by God. As Professor E. C. Moore has rightly said: 'Nature is supernatural to the core, and the supernatural is natural to the limit.' The poet Schiller has some remarkable verses to this effect:

> 'The great Creator
> We see not—He conceals Himself within
> His own eternal laws. The sceptic sees
> Their operation, but beholds not Him.
> 'Wherefore a God'? he cries; 'the world itself
> Suffices for itself'; and Christian prayer
> Ne'er praised Him more than does this blasphemy.'

Supernaturalism and naturalism reciprocally provoke each other. As long as one exists, the other has a relative justification. Most people are materialists, of a sort, and if they are religious, they naturally want a materialistic religion. It is no part of the programme of Liberal Christianity to destroy the belief in miracles. It is enough for us to claim that a standardized orthodoxy, adapted to the supposed mental calibre of the majority, ought not to be imposed upon everybody.

Miracle is one of the burning questions of our day. The question of immortality is another. A great deal has been written on this subject lately, and there is no doubt that the tragic events of the war have led to some rather unwholesome developments of the desire for survival, and the wish to find some tangible proofs of existence after death.

I can obviously touch only very briefly on this subject at the end of a lecture; but this one thing I want to say. The problem of human immortality has been far too much isolated from its real context. It is not a subject on which natural science, or psychical research which ought to be a branch of science, can have anything to say. For the question at issue is not the temporal and perhaps temporary survival of disembodied spirits, or the possibility of a physical resurrection, or of the conscious existence of the soul without bodily organs. These

are not part of the *religious* conception of immortality, though they may interest that large number of people who desire evidence of survival on other than religious grounds. Enquiries which start from these points lead nowhither.

The belief in immortality is really part of the religious demand for a non-contingent world of absolute and eternal values, of which this world is only an image. Individual survival in time is no necessary dogma of religion; but the belief that 'all that is transitory is only a symbol' *is* a part of religion. The proper starting point is the definition of God as '*valor valorum*,' and the faith of Plotinus, which he fortifies by his dialectic, that 'nothing which truly *is* can ever perish.' 'All that is, at all, lasts ever, past recall.' Whatever has value in God's sight is safe for evermore, though in the world of time and place it has finished its course and disappears. This gives a solid basis for our confidence that whatever part of ourselves deserves to be immortal escapes extinction, and lives in the eternal order. We must admit that this belief, though by no means shadowy, is a bare outline, without the filling-in which our curiosity craves for; but we must acquiesce in an ignorance which is almost certainly entailed upon us by the limitations of our mental capacities as human beings. It is useless to appeal either to revelation, or to mysticism, or to science, for more details; they are not procurable. But the hope of eternal life rests securely on the reality of the Divine attributes, truth, goodness, and beauty, in which we can participate even here and now.

If Nicholas of Cusa was right in distinguishing between *infinitum* and *interminatum*; if Hegel was right in distinguishing between a good and a bad infinity, religion is concerned only with the good infinity, with the qualitative, not the quantitative eternal. 'This is life eternal, that we should know thee, the one true God, and Jesus Christ whom thou hast sent.'

It may be asked whether durational immortality is not the symbol and Platonic 'copy' of eternal life. The question is difficult; but we are hardly justified in claiming on this ground a survival in time for which there is no evidence. Baron von Hügel, whose book on 'Eternal Life' is one of the most valuable discussions of the whole subject, borrows from the later Neoplatonists and the schoolmen the conception of *αἰών* or

aevum, a condition between the perfect eternity of God and merely temporal existence, and from Bergson the notion of *durée* as opposed to clock time; and with the help of these two conceptions draws a picture of what human immortality may be. The thought is interesting, but neither of the two conceptions on which it is built is very securely planted.

I cannot expect—I can hardly desire—that this introductory address, which has touched so briefly on several very great and difficult subjects, will please or satisfy all my hearers. We modern Churchmen have no slogans except the duty of wholehearted devotion to truth and desire to find it. Some of us are Liberal Catholics, others are Liberal Protestants; some are Platonists, others Aristotelians; some have a political and social programme, others wish to keep the Church uncommitted to any party in secular affairs; and among the eminent men of science who are to address us we shall probably find equally important differences of opinion. The debates on these matters will go on as long as there are debaters to conduct them. The pendulum will continue to swing this way and that. The heresy of to-day will become the orthodoxy of to-morrow. But humanity is not marking time in the pursuit of knowledge. Science progresses, and, we may piously hope, philosophy too. The new collaboration between the two, the new desire for mutual understanding between science and religion, the weakening of the old dogmatisms on both sides, are a most happy feature of our generation. Think how impossible such a meeting as this would have been a hundred or even fifty years ago. Think of the encounter between Wilberforce and Huxley about men and monkeys, or Gladstone's defence of the Gadarene miracle against Huxley. We seem to have moved centuries since those days; and it is not the Church only which has learned salutary lessons. Our Conference will not attract such large numbers as an Anglo-Catholic Congress, nor as the Church Congress which is to be held here in the autumn; but I shall be much disappointed if those who attend it do not go away with hearts full of thankfulness that theologians and scientists are at least able to meet without the slightest reserve, and with a good hope of being able to work together in the service of the God of Truth.

EVOLUTION A VITAL PHENOMENON

By Professor E. W. MacBride, D.Sc., LL.D., F.R.S.

THE doctrine of evolution is the view that the varied species of animals and plants which we see around us, have all sprung from several, or more probably from only one common stock of lowly ancestors, and have become differentiated from each other as the centuries rolled on by the modification of various portions of the same stock in divergent directions. Since man in his bodily structure and functions closely resembles the higher animals, the doctrine of evolution assumes that the human race has also been slowly developed out of some mammalian stock resembling the modern monkeys, in the same way as the mammals have arisen from lower forms. No doctrine has had such a profound influence on theology as this; indeed it seems to me, as an amateur who has always had the deepest interest in theological problems, to necessitate an entire re-casting of the foundations. We are often glibly assured to the contrary by popular preachers who maintain that evolutionary doctrine can be brought into entire harmony with what the fathers taught. I think that this reconciliation is superficial and erroneous; as a little consideration of what our fathers actually taught and believed will make plain. About the middle of the nineteenth century, the sober and religious Englishman believed that the human race had begun with a single pair supernaturally brought into existence by the fiat of Almighty God: and that these persons had originally been entirely innocent and free from evil tendencies: but that having in the exercise of their free will disobeyed the command of God they became corrupted in their nature and that they handed on this corrupted nature to their descendants, so that the natural man can no longer please God. As a result and as a punishment for their sin not only this pair, but all their offspring were cast out from God's favour, made subject to the ills of this life, to death, and to the pains of hell beyond the grave. Out of His infinite mercy God resolved to bestow favour and grace on certain of mankind: those who would believe in and try to follow the Founder of Christianity were to be pardoned and saved from the consequences of their sin and raised to a blessed existence after death.

These doctrines form a coherent system, the tacitly assumed presupposition of the Church's work and faith. It is true that long before the time I have mentioned individual Christians had strongly protested against the acceptance of these doctrines, at any rate in their extreme form, but these innovators never produced any other system to take the place of the one whose corner stones they displaced. The views I have sketched are unequivocally enunciated by Paul, who is generally regarded as the founder of Christian theology. 'By one man sin entered in the world and death by sin, and so death passed upon all men for all have sinned.' 'They that are in the flesh cannot please God.' Paul regarded it as an unfathomable mystery that God should extend His favour to any of the nations of mankind other than the Jews—it was, in his opinion, a pure act of favour and not to be expected.

The belief that men are born in sin is embedded in the baptismal service; the view that the natural destiny of the nations (the heathen) is death and everlasting loss has been the great motive power of missions for two thousand years. These ideas are handed down from generation to generation, instilled into childish minds when they are in their most plastic state, implied even when not openly stated in all ordinary presentations of Christianity. Now if the doctrine of evolution be true, not one of these doctrines is tenable. If mankind have been slowly developed out of ape-like ancestors, then what is called sin consists of nothing but the tendencies which they have inherited from those ancestors: there never was a state of primeval innocence, and all the nations of the world have developed out of primitive man by processes as natural as those which gave rise to the Jews. In a word, the natural state of man is the outcome of the laws of life which on any theistic view of the universe we must assume to have proceeded from God Himself. It is therefore of the utmost importance to the Church to discover whether or not the evolutionary view is well founded.

Now a little consideration will show us that we can never have direct evidence of evolution, for the development of new species has been a process which has required for its completion a period of time far outlasting the span of a human life. Unless therefore we had the notes of an angelic recorder who had observed the process going on and written down an account of the

various stages passed through as they occurred, we could not produce documentary evidence that evolution had taken place. We are therefore thrown back on indirect and circumstantial evidence which can always be denied. 'If a man chooses to say,' says Huxley, 'that a fossil oyster, in spite of its resemblance to a living oyster, is a mineral concretion and not a shell, it is impossible to drive him from his position by logic—all we can do is to prove to him that to be consistent he ought to regard a dead oyster shell which he finds on the beach as a concretion.' Indirect and circumstantial evidence is, however, cumulative, and I hope to convince you that it has grown to such dimensions that denial of evolution is intellectual suicide.

So far as animals are concerned—and it is in animals that we are chiefly interested, for we are animals—the evidence for evolution is drawn from three classes of facts, *viz.* (1) the results of the comparison with one another of living species of animals, (2) the life-histories of animals, and (3) the results of the comparison of fossil species of animals with one another and with living species. Let us take these three classes of evidence in order.

The comparison with one another of living species of animals, leads to their grouping in species, genera, families, orders and classes. This grouping is known as the systematic arrangement. A species consists of all those individuals living together and differing from one another only in the marks indicative of age and sex, which when opportunity is offered will readily mate with one another and produce fertile offspring. It is to be regarded as a great group of interbreeding forms. Nearly allied species are grouped together in the same genus. Similar genera are collected in one family, similar families in one order—a number of orders in one class, and so on. When two species of the same genus come into contact as a result of their territories bordering on one another, in the vast majority of cases they refuse to interbreed. When crossing is artificially brought about, either no offspring results from the cross, or the hybrids that are produced are sterile.

It is obvious that in explaining the relationships of animals the fundamental problem is the nature of a species, for genera, families, orders, etc., are only names for convenient bundles of these species showing more or less resemblance to one an-

other, and estimates of this convenience vary greatly in the minds of different naturalists, so that what one man regards as a genus another calls a family, and so on.

It was for this reason that Darwin called his epoch-making book *The Origin of Species*. Now some species occupy a quite restricted territory. There are species of land-snail inhabiting each a single valley in Pacific islands like Tahiti and Hawaii. There are, however, on the other hand, species of birds, mammals and insects which extend over enormous stretches of the earth's surface, such as the whole breadth of the continent of Asia. Now when these wide-ranging species are closely examined, it is found that each is split up into a multitude of local races, the inhabitants of each locality differing slightly from those of the next, just as Englishmen differ from Frenchmen. Lord Rothschild, whose knowledge of these races is unrivalled, has informed me that they are found in all wide-ranging species, except in those that resort to one common pairing-ground. Local races differ from species in that when they come into contact with each other and cross they are fertile, but the degree of this fertility varies very much, and it has recently been shown that when widely separated races of the same species cross, abnormal results are produced and individuals which are neither male nor female, but a mixture of both, are brought into the world.

In order to clear our ideas on this subject we may contrast the common eel and the viviparous eel. The former fish has a romantic history. Ascending the rivers from the sea as a tiny thread-like organism, it lives for years in ponds and creeks amidst water-weed and decaying vegetation, where it gradually grows long and fat. When its growth has been fully attained, it begins its return journey to the sea. Surmounting all obstacles, emerging at night from the water and wriggling across grassy meadows, it eventually gains the salt water. Then it swims far out into the Atlantic to a spot somewhere south of the Bermudas. Here the eels from all Europe, Africa and North Asia congregate together: they emit their spawn and then die. No eels that have gone to the sea ever return.

When we compare full-grown eels caught in the rivers which flow into the White Sea with those caught in these islands, in Italy, Egypt and Morocco, no differences whatever can be found between them. Since the spawn of eels from Spain, for

instance, is constantly being fertilized by the milt of eels from Russia, incipient local differences are for ever being smoothed out, and eels are consequently everywhere the same.

The viviparous eel, on the other hand (which is really an elongated blenny) has widely different habits. It is one of the few fish in which the eggs are fertilized in the mother's womb, and the young are brought forth alive and ready at their birth to take up the same manner of life as that of their parents. As a consequence little colonies of these fish are born, live and die in the same spot, and we find in this species numerous local races. At spots so near each other as the mouth and the upper end of a Danish fiord, the strains of viviparous eel are distinguishable from each other.

Now we ask any reasonable person, is it conceivable that each of these local races owes its existence to a special act of creation? Is it not clear that the special influence of each locality produces a different reaction on the part of the individuals living there and that the relatively sedentary life of these animals prevents intermingling between adjacent colonies and that so these racial differences are perpetuated from generation to generation? If this be admitted the principle of evolution is granted, for there is no line drawn between these races and nearly allied but distinct species. We used to plume ourselves on the supposed fact that we had one species of bird wholly confined to these islands. This bird is the famous red grouse of Scotland. Yet when this bird was introduced into Norway it crossed freely with the willow or reaper grouse of the Continent, and in two or three generations the progeny became indistinguishable from those of the willow grouse. Is the red grouse a true species or not? Who can tell? Species then are merely races which in time have become so distinct that they are mutually sterile, and in the case of most species sterility is guessed at but not known by experiment to exist.

We now turn to consider the second class of evidence, *viz.* that derived from a study of the life-history. *A priori* it is difficult to see how the life-history of an animal should throw any light on the past history of the race: but when we come to look into the matter we find in many cases it is obvious that the development of the individual is a recapitulation of the past history of the stock to which it belongs.

One or two examples will make this perfectly clear. There is a group of fish called the cat-fish, none of which are found in Britain but which are widely distributed over Europe, Asia and North America. They derive their name from the tentacles which spring from the sides of their mouths, which are fancifully compared to a cat's whiskers. Practically all these creatures are fresh-water fish, which use their tentacles for grubbing in the mud at the bottom of streams and which breathe the air dissolved in water like other fish. But one cat-fish found in India ('Saccobranchus') differs from all the others in coming to the top of the water in which it lives and breathing air, which it takes into two long sacs. These sacs, which we may term lungs, for they act as such, extend half-way back to the tail under the skin. But if the development of Saccobranchus be studied, it is found that when young it is entirely devoid of these lungs and is just like other cat-fish, but as it grows the lungs gradually appear as out-pocketings of the gill-chamber. Does anyone seriously suggest that Saccobranchus was not derived from an ordinary cat-fish? If it was, its development certainly recapitulates its evolution.

Another example may be given. The hermit crab differs from ordinary prawns and crayfish in having a twisted abdomen covered with a thin cuticle. This portion of its body it protects from injury by thrusting it into the empty shell of a marine snail, such as a whelk or periwinkle: yet when the hermit crab is young its abdomen is as straight and symmetrical as that of any shrimp.

In general we may say that when in any group of animals we find a uniform type of habits common to nearly all the species of the group and associated therewith similar structural arrangements, then if we examine the life-history of any aberrant member of the group we find that its structure and habits when young conform to the type normal in the group and only diverge from this norm as the individual grows to maturity.

The recognition of recapitulation in development has enabled us to probe more deeply into the past evolutionary history of animals than even the study of fossils. For only the hard parts of the animals which became fossil have been preserved, and in many animals there is no skeleton sufficiently tough to

esist the disintegrating influences of time, and in others the keleton when preserved tells us very little of the body of the nimal. We have to recognize, however, that not every feature vhich we see in the young of an animal is a repetition of the condition of a former ancestor. Special adaptations of the young to special dangers are often found, and these may be compared to secondary falsifications of an historic record; but by a wide survey of life-histories these may be detected and allowed for, just as the historian relies on the points in which he ancient manuscripts agree and regrets those in which they differ. Thus we have been able to show that animals so diverse n appearance as cockles, clams, whelks and snails on the one nand, and the various kinds of worms on the other, have all sprung from one primitive group of simply organized marine elly-fish which swarmed in the primitive seas; and again that he great class of vertebrata (including fish, amphibia, birds, reptiles, warm-blooded quadrupeds and ourselves) on the one nand, and the strange group Echinodermata, which comprises sea-urchins, starfish and the crinoids or stone-lilies of our rocks on the other, are both descended from another simple group of early swimmers in the sea. These discoveries, which read almost like romances, are even less startling than that which concerns the ancestry of the sluggish sea-squirts or ascidians. These lowly organisms, whose only sign of life is the rapid closing of the two main orifices of the body when they are irri-tated, and which in appearance are difficult to discriminate from sponges, are found clinging to the rocks at low tide. When hey are young, they are tadpoles with brains, back-bones and gill-slits, which in many respects resemble the young tadpoles of frogs, and therefore belong to the class vertebrata. Like he early tadpole of the frog, the ascidian tadpole possesses a sucker on its chin by which it can attach itself, but whereas the frog tadpole after a temporary period of rest resumes its active life, the ascidian tadpole once it becomes attached remains adherent for the rest of its existence.

The human embryo at one period of its development has slits in its throat like the gill-slits of a fish, and at a later period it has a short tail. The most convincing evidence of man's descent from an animal ancestor is derived from the study of his development.

This strange tendency of every species of animal to climb its own ancestral tree appeared to the naturalists of last century as an empirical fact for which they had no adequate explanation. I hope to be able to convince you that it throws a brilliant light on the inner nature of the evolutionary process, but we shall defer the discussion of this point till we have considered the third category of evidence in favour of evolution, *viz.* that derived from fossils. This kind of evidence, since it deals with the actual remains of animals which lived in past ages and not with inferences as to their nature derived from the study of living forms, ought to be the most satisfactory of all; but, as a matter of fact, when the *Origin of Species* was published it was the least satisfactory, and therefore Darwin had to lay great stress on the 'Imperfection of the geological record.' This weakness of the geological evidence was seized on and greatly stressed by his opponents. Darwin gave very good reasons for the fragmentary and unsatisfactory character of the fossil record: but since his time a great deal of intensive study has taken place all over the world, and in one or two cases a record of the past history of some animals has been unearthed which is so complete and convincing that it may be regarded as the final proof of the truth of the theory of evolution. Of such records two examples may be given. During that vast period of time which geologists term the Tertiary period, that part of the continent of North America now occupied by the Rocky Mountains was a great plain drained by wide, sluggish rivers like the present Mississipi. Since then the land has been raised thousands of feet and the rivers have cut deep gorges through their former deposits and now run as torrents to the sea through chasms the most celebrated of which, the Grand Cañon of Colorado, has sides a mile high. But at the time of which I speak this elevation had not taken place, and the rivers meandered sluggishly through bush meadows. Every spring-time they overflowed their banks and produced great floods which extended for miles, and many of the animals that grazed on the plains were overwhelmed and drowned and their remains entombed in the beds of silt which were deposited from the flood. In this way a yearly record of the life of these was observed and preserved. These beds of silt are now converted into hard

ock, and have been cut into by the gorges which I have just mentioned; and in the sides of the gorges the edges of the beds are exposed, and their contained fossils can be seen and extracted. In these great natural books, as we may call them, the entire history of the camel is preserved. In the earlier beds we find the remains of four-toed, grazing animals, in the structure of their limbs and of their teeth half-way between a pig and a deer. The teeth, like those of the pig and incidentally like our own back teeth, were studded with blunt tubercles, the toes were incased in hoofs and the animals stood on their tips of their toes. As year succeeded year these creatures gradually changed into camels. The side-toes gradually grew more slender and disappeared, the central toes became closely pressed together above, but began to diverge at their tips so as to produce the characteristic splay-feet of the camel. The neck became longer, the front upper teeth dropped out, and the tubercles of the back teeth became connected into ridges and so converted into efficient masticating machines, and at the end of the series there is an indubitable camel. Yet so close is the succession of forms that two successive steps in the series are hardly distinguishable from one another, and my friend Prof. D. M. Watson assures me that the whole of this remarkable evidence, which is contained in the American museums, will never be published, because no museum or scientific society in the world could face the expense of producing the illustrations that would be required. This whole change is correlated with a gradual change in climate, which became more arid, so that the meadows changed into sandy steppes and the luscious vegetation of the beginning of the period gave way to the harsh dry desert plants of the end, and as a result of this change the masticating power of the teeth of the camel had to be constantly improved.

In another part of the same area we find the complete history of the evolution of the horse. Here, too, in the earlier part of the period we find four-toed grazing animals with their back teeth studded with tubercles. As time went on they changed into horses, becoming at first three-toed and finally one-toed forms. And as in the case of the camel, each step in the process is so close to its predecessor that it is hardly possible to distinguish between them, but there is one new fact which emerges

which is of the very greatest interest. It is not, as in the case of the camel, one stock which is developing in a certain direction, it is several allied stocks. There is strong reason for believing that in Miocene times there were three-toed donkeys as well as three-toed horses, and that the donkey and the horse have been evolved out of separate though closely-allied stocks.

This phenomenon of allied but different groups of animals undergoing changes in the same direction is one which is frequently met with when the geological record is closely examined: it has seized on the imagination of many scientific men and has led them to what I cannot but consider a wholly unwarrantable conclusion. They have invented a mysterious force called 'orthogenesis' which they imagine dominates the heredity of groups of animals and causes these groups to change in certain ways with no relation at all to the use or functional importance of the changes that are so caused. I think that it is possible to suggest a simple and rational explanation of the facts summarized under the title 'Orthogenesis,' and this will emerge when the causes of evolution are discussed.

The evidence that I have put before you has, I hope, convinced you that evolution has really occurred; but now arises the all-important question how the process has been brought about. In the last century most naturalists would have glibly replied, 'natural selection.' But this is, when carefully examined, the shallowest and most unsatisfactory of answers. I am not for a moment denying that natural selection exists and is a most powerful agent in nature. When we recollect that a female cod-fish will lay in one season nine million eggs, and that out of all the eggs that she lays in her lifetime, on an average only two will reach maturity, we see what an appalling and devastating thing this selection is. To my mind, it is the main moral enigma with which we meet with in Nature. To talk in a facile manner about evolution fulfilling God's purpose, ignoring the waste and death with which it is accompanied, is to skate over very thin ice indeed. But selection—that is the death of the many—does not by itself alter the character of the few which survive. Those that 'happen' to possess a character which differs from the normal in the right direction are those that are preserved. But how does this

happen'? Is it scientific to invoke chance as the cause of deviations from the normal? Surely it is indefensibly unscientific, and yet this is the actual procedure adopted by even modern exponents of evolution. We may refer to Professor Holmes' recent book on 'Problems of Eugenics and Evolution' for an example of this kind of argument.

The fact is, as Dr. Bateson pointed out long ago, that 'variation is evolution,' and if we are in any way to get nearer to the nature of evolution, we must try to understand variation. Darwin pointed to the fact that no two members of the same family, brood or litter were exactly alike, and he supposed that these differences were inheritable and constituted the raw material, so to speak, on which natural selection worked. But even this assumption would be insufficient. We should have to assume, further, that each individual showing a deviation from the normal was capable of giving rise to offspring which not only reproduced the deviation, but some of which exhibited the same deviation in still greater degree. If this really were the law of inheritance, we should have to accept it as an empirical act, though it would be a very mysterious one. But when this assumption is tested under standard conditions, it turns out not to be true. When we raise a family of offspring from one parent alone (as can be done with self-fertilized flowers and hermaphrodite animals) the same differences between brothers and sisters show themselves, but these are not inheritable. When two parents are involved these often belong to different strains and bring in different inheritable tendencies which are variously distributed amongst the children and lead to differences which are inheritable till all but one strain are eliminated by selection, and then no further progress is possible.

But every breeder is aware that a marked deviation from the normal occasionally 'crops up' from unknown but doubtless sufficient causes. These deviations, usually termed *sports* or *mutations*, are very strongly inheritable, and many naturalists, such as De Vries, the botanist of Amsterdam, and Morgan, the geneticist of New York, think that natural selection seizes on these 'mutations' when they appear and selects them for survival, and that so evolution is brought about. There are, how-

ever, two great difficulties in the way of accepting this conclusion: these lie in, first, the nature of these mutations, and, secondly, in what we are beginning to find out about their origin.

To take the first point to begin with. If we examine the nature of the differences which distinguish allied natural races, we can generally make out that these are what we should call functional and are related to slight differences in habits. Thus the viviparous eels, alluded to above, which live at the mouth of the fiord are longer and slenderer animals than those living at the upper end, because the former lead a more active life, ranging out into the sea, and the tail, which is the organ of locomotion, is better developed in them than in their more sluggish brethren. It is true that we cannot always see the functional meaning of the differences between allied species, but this is almost certainly due to the fact that we are in most cases unable to analyse thoroughly their reactions and their habits. Now mutations are all, without exception, non-functional in character. They are, as Holmes candidly admits, 'failures from the point of view of natural selection,' and can therefore have played no part in evolution. Not only so, but many of them are pathological, that is, of such a kind as gravely to impair the capacity of their possessors to go on living: and this brings us to the second point, the causes of these mutations. Recent investigations as to the origin of the fancy races of goldfish, which are of all cultivated races the most bizarre, suggest very strongly that these races owe their origin to the bad effect of lack of oxygen on the eggs during the first stages of their development. China is the country where all these varieties have originated, and the Chinese keep their fish under the most insanitary conditions in small jars ranged on shelves in dark insanitary huts, and in these jars the spawn is laid. Much of it dies, and amongst the survivors all sorts of abnormalities appear: the most striking of these are selected as parents of the fancy breeds. Their peculiarities are transmitted in varying degree to their offspring: those showing the points of the 'fancy' in the strongest degree are selected, and so after a few generations the breed becomes reasonably constant in its characters. The German zoologist who investigated the case main-

ained that what is transmitted is not a special set of characters ut a lessened degree of vital energy. This diminution of nergy shows itself in two ways, *viz.*, in more sluggish movenent and in lesser developmental force. The result of this veakness of development is the suppression of some organs nd the monstrous development of others. By subjecting the ggs of frogs and newts to similar evil conditions, monstrous adpoles were obtained resembling in their peculiar features the aces of goldfish.

Now if the cause of the mutation is a lowered vital energy, hen mutations in the unsheltered wild would be inevitably viped out and would leave no descendants to influence future generations. We must therefore look elsewhere for the origin of the variations which have survived. Now we know that every animal possesses in a limited degree the power to adapt itself to new circumstances by changes in habits and consequential changes in structure. Thus when we go to the seaside our skins become tanned as a consequence of exposure to pure air and sun. This tanning is due to the development of pigment under the skin which acts as a screen to prevent the deleterious ultra-violet rays from entering the body. If we allow our children to run about bare-legged, their limbs become covered with a thick coat of fine hair. Such instances could be multiplied *ad infinitum*; they are examples of the power which all living things possess when they are confronted with hostile forces of rising up to meet them—in a word, *reacting*. When an incident force acts on a dead body, it is passively moved, but the action of a living body cannot be predicted. If we kick a dead dog the motion of its body can be exactly calculated from the force of the kick and the weight of the body—but if we kick a living dog a vastly different result may ensue.

Now the changes in habit and structure acquired during the life struggle are passed on to the children—not directly, but as an increased capacity when exposed to the same circumstances to develop the same habits that the parents did and the accompanying structures. This transference of the effects of habit was believed in by the protagonists of evolution such as Professor Haeckel; it was denied by Weismann and the 'mutationists' generally; but it has recently been proved to

be true by the well-planned experiments of Dr. Kammerer, of Vienna, and of Dr. Durkhem, of Breslau. This proof is of colossal importance for the theory of evolution : for when using all the means at our disposal, we seek for the ultimate reason for the cleavage of an ancient stock into two, we find that this was the adoption of different habits—in a word, of different means of obtaining a livelihood by different portions of the stock. Thus, if we trace our monkeys, our dogs and cats, and our hoofed grazing animals back to Eocene times, they all insensibly grade into one uniform type of long-bodied, long-tailed, four-footed animals with simple teeth and long snouts, which were plantigrade, that is, walked on the palm of the hand and the sole of the foot.

But why should some members of a stock take up different habits from the rest of the stock? In answering this question we reach the inner essence of the life of animals. It is characteristic, as a great psychologist has told us, of the behaviour of living animals that their activity, though it may be roused by a stimulus, persists after the stimulus has ceased to operate, is directed towards an end and strives to reach that end first by one means, and then, if that fails, by another means till success is achieved. If, then, under given circumstances animals can satisfy their hunger in one way, and they will do so, but if this way fails they will try another way, and in so doing will adopt a different set of habits which may become the starting point for a new line of evolution.

We are now enabled to see the meaning of both recapitulation and orthogenesis. When an animal takes on a new set of habits, it usually does so when it attains a certain age and strength. During the earlier period of its life it keeps on its old habits. Its children will do likewise though they will assume the new habits on slighter provocation than did their parents. It is this early period of life during which the old habits are retained that is the basis of recapitulation. Heredity may in many respects be compared to memory, and recapitulation is the preservation of old racial memories.

Orthogenesis—or the apparently fateful and irresistible modification of all the species of a family in the same direction—ceases to be mysterious since it is nothing more than the

similar reactions of allied animals to some general and similar change in their circumstances. In these days, for instance, that lower grade of vertebrates known as reptiles are hard put to it to maintain themselves in competition with the more highly organized mammals, and so those which have not sought safety in the water, like crocodiles and turtles, have taken to a slinking burrowing life among crevices and have become snakes. The snake-like form has been independently evolved by at least a dozen families of lizards.

In conclusion, we may say that all life is essentially striving or struggle, and that evolution in the true sense is the result of an increasing endeavour of living things to adapt themselves to a changing material environment. It has nothing to do with the so-called evolution of Herbert Spencer—the collapse of an unstable homogeneity into a more stable heterogeneity such as he supposes took place when a nebula gave rise to a solar system; true evolution is a vital phenomenon and is not capable of any mechanical explanation whatever.

THE POSSIBILITY OF PURPOSE

By the Rev. S. A. McDowall, B.D., Author of *Evolution and the Need of Atonement.*

THE term *purpose* is somewhat indefinite. It may indicate that the processes of conscious life show a kind of continuity, like that of attention, which becomes intelligible in the results in which it issues, as is the case in man; or it may have a somewhat wider teleological connotation which embraces, perhaps metaphorically, the world at large. More precise definition would involve discussion both of the element of consciousness in purpose, and of the Argument from Design; and I think it better to accept for the present the usual somewhat vague signification of the word, postponing any attempt to give to it a more precise meaning until later.

I propose briefly to examine some aspects of the world we live in as they present themselves to the physicist, to the biologist, to the psychologist, and from this examination to form

an idea of the meaning of purpose with a view to its definition. And this definition will lead us into the domain of the philosopher and the theologian.

The physicist observes phenomena in ordered groups whose fundamental configurations conform roughly to one or other of a few fairly simple schemes. Atoms and molecules are planetary systems in miniature; substance and stellar system differ in size, but not in broad essentials. Energy travels through fluids and through the ether in modes not dissimilar: ripples and waves and light and heat have much in common. There seems to be everywhere a tendency to form closed systems in a kind of dynamic equilibrium; *but*, the systems are never quite closed or quite in equilibrium. Through all is found the tendency to degradation or dissipation of energy. On a balance, each and every failure in equilibrium renders some energy less available. In the long run this katabolic tendency, as we may term it, may lead to considerable gross change. Radium may pass over into lead; the impelled *a*-particle may use the energy supplied to it to smash a nitrogen atom into hydrogen; a stellar explosion may shatter some planetary system and dissipate its energy in light and heat and hurtling star-dust.

The physicist thus finds a tendency to closed systems and a distributed dynamic equilibrium of the many, but these are never achieved, and always degenerate towards a single useless equilibrium of one system, having no available energy. His world is katabolic. There is for him no *necessary* evidence of purpose in the systems themselves: Paley's Divine Watchmaker is no more than an unsupported hypothesis. But certain things give him pause, even when he surveys his own limited domain. He is, for instance, brought up against a probable unknown, the ether, which if it is really possessed of the properties which seem to be demanded, must be for ever unknown, for no direct experiment *can* reveal it. His method proclaims its own limitations. Turn where he will he finds himself trespassing over the border of metaphysics. And *himself* is still unaccounted for.

The biologist also finds a tendency towards closed systems of a different character, each in equilibrium. The cell, the organism, the species; each represents a closed system in equilibrium with its environment. And again, the systems are

not completely closed; again there is change and the degradation of energy.

But two factors appear whose presence profoundly affects the biologist's point of view. In the first place there is an anabolic process at work, in the cell, in the organism, in the race even; a process of building up, of rendering energy more available. Individual organisms feed, and repair their waste; the germ-plasm, passed on, takes to itself new matter, making a new body. In the second place the organism is capable of adaptation and evolution, and this represents a definite tendency to escape from equilibrium, not in the passive, katabolic mode of a degenerating physical system, but in an active, anabolic mode, which he is able to recognize also in the efforts of the individual organism to satisfy its desires, using its environment as an instrument.

In the world of the physicist, then, there is a tendency for a small system nearly in equilibrium temporarily to retain something of that equilibrium, but yet to change degeneratively towards a universal equilibrium. In the world of the biologist there is a tendency to avoid the degenerative change, or rather positively to escape from it. Equilibrium is fatal to the organism, and leads eventually to extinction. Progress (leaving the word undefined at present) is essential. Moreover, we can see why this is so. Just because not all physical systems in the universe are closed, none can be so; and the katabolic process goes forward. Just because the physical environment of the organism consists of these systems which are not closed, the organism must progress or degenerate—must be itself not closed; and just because there are these organisms which are not closed systems, and organisms are part of the environment of each other, no organism *can* be closed. The alternatives are, to accept the katabolic process of the physical world, and degenerate, with the degradation of energy, into the extinction of the life-process; or to refuse equilibrium actively; to escape upwards, not downwards, from the closed system; to seek out the factors which upset equilibrium and use them to an end—freedom. Along this road the living organism moves: progress is his characteristic and his prerogative. And here we begin to see signs of our undefined term, *purpose*. Not that

the escape is consciously undertaken: it is not a *self*-purpose as yet. Nevertheless, there is present an element of individualism, since *each* organism is acquiring control over its *own* environment. And freedom is, after all, the power to make the environment subserve the organism's ends. The higher we go the more we find the creature making use of some of its environment; living not merely as the sport of circumstance. Man is the highest animal, because he is the freest in this sense.

But although in each lowliest organism we see this element of purpose, we cannot regard the organism as just an individual; through the continuity of the germ-plasm he is linked with the race. Moreover, it seems likely that the primaeval living organism was in a sense immortal, and that the continuity of the germ-plasm represents this immortality in a modified form. But individuality does begin and develope, for reasons which we can in part understand biologically; and we thus are driven to differentiate between organism and race. In the organism we see the beginnings of an individual sense of value, which finally leads to consciousness and a self; in the race we see the same process—the refusal of equilibrium—manifested in serial form as evolution. Yet both individual and race progress are based upon the same urge. Consequently, if we speak of purpose at all in the individual—as we must and do when that individual becomes self-conscious, while the infinite gradations of consciousness make the drawing of any line impossible—we must also speak of purpose for the race. It may be said that purpose is a term belonging exclusively to the individual, and even to the self-conscious stage. Here evidently lies the crux of the matter of definition, and to this we shall return. At the moment we are only concerned to note the essential continuity of what we observe in race and individual. In the inanimate world are systems which are never quite closed, and the katabolic process. In the animate world use is made of this; the germ-plasm, and for a time at least the body itself, manifest anabolic activity, and progress and freedom result from the refusal of equilibrium or—what is the same thing—from the utilization of the not-closed. In life as a whole, in evolution, we see an élan vital, an entelechy, call it what you will, which makes for the progress of the race through the freedom of the individual;

and this suggests the idea of purpose in the whole, in some vague, undefined sense, since we find a for-self-ness emerging in the individual from which eventually we derive the concept of purpose, and find also a continuity of process throughout in the existence of systems imperfectly closed and the results of this.

But another factor gives the biologist also pause. The for-self-ness of the individual issues in personality, in which it becomes intensified into its opposite—if we may use so contradictory a phrase—into not-for-self-ness or purposive altruism. The biologist notes that in the evolution of the race also is found a kind of unconscious altruism. Evolutionary process recks little of the individual: all is for the race; yet it is through the individual that evolution functions. He notes, too, that in the personality of man the two streams unite. The best men are those who are for-themselves in order to be for-others. Purpose has found a new direction. What we may term instinctive adaptation, combined with instinctive individual refusal of equilibrium, has given place to purpose which is, in part at least, conscious, and is not directed wholly to self-ends. Finally, the biologist sees spiritual adaptation which suggests a spiritual environment, and this too gives him pause.

The psychologist sees in man instinctive reactions, still functioning it is true, but giving place to others which are conscious. Conduct is still largely governed by the first, but we are a little ashamed of them, rationalize their promptings, and when the final course of action is decided by conscious judgment, as I believe it is sometimes, point proudly to this as vindicating our self-esteem. The great primary instincts of sex, and fear, and hunger, and self-preservation, and herd, still play their part, and may even unpleasantly assert the fact that they are being kept down, as the victims of neuroses know to their cost; but probably these conditions, and perhaps even dementia praecox, are fundamentally atavistic, and owe their worst features simply to conflict with the later developments which overlie them. Anyhow, the psychologist sees instinctive reactions normally giving place to reasoned ones, and it is these last which are the most individual and the most purposive. He is driven to apply the Recapitulation Law of the biologist, which states

that the organism in its embryonic development passes through the successive stages of its ancestral history in an abbreviated and confused form. The long-tailed human embryo with its gill-arches and oro-nasal grooves is familiar; but the law holds for mental development as well as physical. The instinctive, the imitative, the acquisitive, and the reasoning stages of the child are clear; and the way in which the instincts come again into modified prominence under neurotic conditions, masking some of the activities of the rational stage, gives additional evidence, emphasizing the fact of mental evolution and assuring us that the general movement is towards freedom and reasoned individual purpose; that these represent the highest stage. But the psychologist pauses before spiritual phenomena which, try as he will, refuse to be explained by what has gone before, and seem to claim that in themselves lies the explanation of all.

The foregoing rough outline seemed a necessary preliminary to a discussion of the possibility of purpose, although so brief a summary must be full of over-categorical statements which require amplification and modification. It has given us certain clear ideas, which we may briefly formulate.

(1) Each branch of science finds something beyond its own proper range, which will not yield to its methods, but which *may*, on the other hand, contain the explanation of what goes before.

(2) We know purpose in ourselves as a directive which shapes our activities towards ends, and we treat it as if it were conscious. That these activities are also shaped by influences of which we only become conscious subsequently or not at all is true, though not till lately have we begun to realize in how great a measure. We find this purpose directed to our own comfort and well-being, though the criteria of these change entirely as we develope. At first individual desires are paramount, but at last they come to be merged in something else—in love and unselfishness.

(3) In the lower organisms we find a similar desire to control circumstance instead of being controlled, unconscious at first, but becoming more and more individual, and gradually crossing the threshold of consciousness.

(4) But side by side with this tendency to an individualism, in the lower organisms, directed to self-ends, we find a race-phenomenon directed towards the evolution of the race. Not being individual this remains necessarily unconscious, though it is altruistic. Only in man do these two diverging streams, which spring from the very character of life in its simplest manifestations, converge again, being unified by the activity of consciousness, and issuing in unselfish love and public spirit.

(5) We see the origin of both streams in the basal tendency of living matter to utilize the fact that no physical system is completely closed in arresting in part the katabolic tendency of the physical world, storing up energy for its own advantage.

We may now turn directly to the question of purpose. There can be no question that, however we may define it, we arrive at the idea of purpose from our own experience, and that in its fulness it carries the connotation of consciously-directed activity. This full purpose is essentially characteristic of a person, and implies action directed to a definite end which is consciously desired and consciously sought by the individual. It is in fact fully conative. This view is not usually adopted by the psychologist, because he knows that many unconscious desires only become conscious when the action directed to their achievement is thwarted. Now it is perfectly true that we can draw no hard and fast line anywhere, and we are consequently, and naturally, inclined to throw back the idea of purpose (which we have gained from our own experience) and thus to see purpose also in the unconscious striving and for-self-ness of the individual organism right down the scale of life. I would suggest that logically we should see purpose also in the evolutionary ascent of the race. Now this is to go too far, or not far enough, I think.

The conception of a kind of race-purpose and race-consciousness which is not in any individual is very common to-day. It underlies much that is written, for instance, about primitive religion and psychology. I must confess to viewing a usage of terms which to me is almost allegorical with some misgiving. Doubtless it is impossible to draw a line and say, 'Here purpose begins'; for directed action in living creatures may be fully conscious, or half-conscious, or practically unconscious,

through every gradation. Doubtless also we incline to call all actions directed to an end purposive, and thus to see purpose in the individual and the race all the way down: to see it in evolution itself. But surely this is because we transject what we know of our own *conscious* actions into the actions of animals—naturally enough, since we believe firmly in continuity. Nevertheless I am going, in this paper, to maintain the view that *purpose presupposes personality*; taking it almost as a slogan, since it challenges a good deal of current opinion. I hold it true to say that our whole idea of purpose derives from our experience as personal beings, projected conceptually into a completeness that is perhaps never fully realized in fact; and I would therefore define purpose as *the directive of action towards an end, of which directive the person is conscious, as well as being conscious of the desire and of the end.* I suggest that a fully-developed purpose is fully conscious, and that our idea of purpose, though it is never completely realized in ourselves, contains the concept of such full consciousness, and arises therefore out of the concept of full personality at which we arrive by extrapolating the curve, so to speak, of our own imperfect personality. It may no doubt be objected at the outset that when we are conscious of purpose in our actions, the *action* is primary, the *purpose* secondary: that our idea of it is due to our habit of rationalizing our beliefs and activities and imagining that we have thereby arrived at their cause: deluding ourselves with the notion that the beliefs and activities are themselves due to reason. I do not myself believe that this explanation is the true one; but in any case it is irrelevant, since we see directed action as a primary characteristic of all animals, becoming more marked the higher we rise in the scale till man becomes conscious of it, which consciousness (and rationalization) is then the characteristic of personality which converts directed action into a true purpose.

The objection here offered to the ordinary view, then, is that it goes too far in calling the unconscious for-self-ness of the organism by the name of purpose. I doubt the accuracy of calling all action directed to an end—even reflex action—in itself purposive. Yet the existence of full purpose in man, and its continuity with the unconscious directedness of animal life,

and of evolution, does demand explanation, and I would suggest that the explanation which we have just ruled out errs as much in not going far enough in one direction as it errs in going too far in another.

If the definition given holds, the possibility of purpose in the whole universe acquires a peculiar and different shade of interest, for it becomes necessary either to deny the existence of any purpose, and therefore of any intelligibility, in the universe at all, apart from the epiphenomenal purposes of man and the graded epiphenomenal rudiments of purpose in the lower animals, or to look on the universe as manifesting the results of a directed conscious activity on the part of a Personal Being. The former view seems to me difficult, if only on account of the race-phenomenon we call evolution. No rudiments of *individual* purpose in the organism can account for the progressive utilization of environment of the *race*, or for the successful and advancing ability to take advantage of the fact that no physical system is completely closed. We need two independent yet harmonious sets of epiphenomena.

Further, when we observe in man the union of these two streams of individual egocentric action and of altruistic concern for the race, through which all the forces which make for progress can be, and in some degree are, consciously applied, through the prerogative of personality, it seems natural to believe that there is *one* purpose in the whole; that the very existence of physical systems which are not closed, and of life which can utilize their energy for self-ends, is not fortuitous—that there is a conscious directive of action behind it all: Personality: God. I do not think that such a conclusion is a demand for anything *praeter necessitatem*, for I cannot myself conceive any other *single* explanation of the existence of these two directed streams in the individual and in the race, so different in their course, yet joined into one mighty, rational, and comprehensible source of action in the personality of man; and human personality has an ineradicable tendency to demand a single, comprehensive explanation, and to believe in an intelligible cosmos, not an irrational chaos.

The psychologist is beginning to show us the actual union by which these two streams become directed to a common task

in man; and his work is going to illuminate much that is still dark. Especially it has already shown us how disastrous to personality itself are the results when the two streams are prevented from flowing harmoniously in a common channel—a phenomenon in itself constituting a very strong argument.

We must, however, remember that such a conclusion is entirely dependent on the accuracy of our definition. But if the idea of purpose does not presuppose personality, we are using a term which I, for one, do not understand. There may still be purpose in the world, but I cannot talk about it, for I do not know what it means. But if, when we ask if there is purpose in the world, we mean purpose in this full, personal sense of the word, then I maintain that in our very discovery of direction in the universe we are really presupposing a Personality behind it all, and are asking whether any version of the Argument from Design is tenable, where the Designer is personal in the same kind of way that we ourselves are personal. This question I believe we may answer in the affirmative. We have, after all, the fact of bodily evolution and the fact of spiritual evolution. We believe that evolution is necessarily adaptation to environment, and we are driven eventually to predicating some kind of spiritual environment. To-day, however, we have taken a somewhat different line of argument, noting the general *directedness* of the organism's activities, and the general *directedness* of evolution, since directedness is a chief character of purpose. We have seen how this directedness flows in two streams, the individual and the racial, which reunite in the conscious activities of man. We have seen that each specialist is driven beyond the bounds of his own science by the existence of phenomena unaccountable within the strict limits of his method, and strays inevitably into the realm of metaphysic. We have seen that it is the existence of systems in the physical world which are not quite closed that makes organic evolution possible. True, the directedness that we find is for the individual and the race of *living* organisms, and not for the physical system itself; but one is driven to seek some explanation of the physical conditions which make possible this directedness of life. If life be directed towards personality in such a way that personality, looking back, seems to find purpose

n life and its conditions; then, knowing what we do of the ature of personality as the capacity for fellowship, we are, I hink, almost driven to conclude that the cause of *all* pheno- nena of the universe lies also in the purposive activity of a Per- onality which demands fellowship. After all, we are only ollowing the accepted principle of seeking an explanation of he beginning in the light of the end. Of this universe we now little, except concerning the earth on which we live, but *x pede Herculem* is no unsound doctrine. It would take us ar too long to examine this idea further; but after all we are nly concerned at the moment to discuss the *possibility* of pur- ose, and this we find suggested in the existence and nature f the élan vital, together with the existence and nature of in- ividuality, and their union in personality.

I do not, of course, mean to suggest that God directs evolu- ion. Such a view would land us in severe theological and hilosophical difficulties, and would appear to be contrary to ne probable facts. What I do suggest is that the nature of the niverse and the nature of the life-activity indicate the solution nat there is a Personal God behind, Who purposes something, nd makes it's achievement possible, leaving the living organ- sm free to achieve it if and as it will. If there be a Personal God this is what one would expect, for personality seeks fel- owship, or love: and love cannot be compelled or made, but nust grow and move of its own free volition. Personal beings who shall love God cannot be made: they must make them- elves in their environment. But the purpose they themselves chieve helps them to see the bigger purpose in the whole, and eads them to closer understanding of, and union with, the 'ersonality of God.

And here we must leave this matter, all incomplete as our resentation has been, to say a final word on the philosophical nplications of such a conception.

To predicate purpose implies and involves the idea that ne universe is comprehensible. We arrive at the idea of pur- ose in the universe from the idea of purpose in our own lives. Ve conceive of personality behind that purpose, because pur- ose has meaning for us only in relation to personality. And e conceive that purpose as comprehensible because we have

an ineradicable certainty of something in common between our personality and God's—that personality means the same thing all through.

Now this concept of purpose must affect our idea of Reality in a very vital degree, for it makes Reality to be something that is in process of being experienced. Reality becomes indissolubly linked with happening, and does not remain within the domain of pure thought. Reality is not something that is there to be experienced, still less to be thought, but rather something that is being experienced, not in thinking alone, but in living. Gentile has given us a conception of knowledge as pure Act: this idea of purpose carries us further and suggests that Reality is pure Experience—that is, experience in process of being experienced: a living, growing activity of being; personality in relation with other personalities. In such a conception there is room for purpose; and in spite of its metaphysical difficulties (not, I believe, insuperable) it seems to me to offer the only explanation of the universe that takes full account of our judgments of value, and that gives an adequate place to the greatest of human experiences, the experience of love, while leaving room for the phenomena of individuality and evolution and matter. I have tried elsewhere to give a fuller though still preliminary, presentation of this view of Reality, but here one can only just touch on it. Suffice it to say that if Reality be finally the experiencing of Personal relations, then purpose must necessarily play its part, initially and throughout; and we find a *που στῶ* for the directedness which we seem to observe in the natural order of the world. Purpose becomes not merely possible, but integral.

Inevitably we have touched on many matters very lightly, and inevitably, I fear, the need for brevity must have sounded like dogmatism. May I, in conclusion, ask you to forget the apparent dogmatism, along with many other imperfections of this paper, and remember only that its intention was to offer suggestions to your consideration. I myself believe these suggestions to be generally true, and to be capable of an extension that can satisfy the heart and the experience as well as the mind of man, giving him a firm basis for the belief in purpose and in God which seems to be innate and ineradicable.

[1] *Evolution, Knowledge, and Revelation.* Hulsean Lectures, 1923-24

THE UNIVERSE AS REVEALED BY MODERN ASTRONOMY

By the Rev. Hector Macpherson, Ph.D., F.R.A.S., F.R.S.E.

THE modern science of astronomy is little more than three centuries old. It is true that over 380 years have elapsed nce the corner-stone of the edifice was laid by the publication the great work of Copernicus, *De Revolutionibus*. In that ook the quiet recluse of Frauenburg formulated the theory nich was to have so profound an influence on human ought, that the apparently immovable Earth was in motion und the apparently mobile Sun. But for the best part of a ntury the new heliocentric theory was laughed out of court the dream of a crank, not only by the theologians, Roman nd Protestant alike, but also by the professional scientists of e times, and it was only when Galileo and Kepler, working ong independent lines, were driven to accept the Copernican stem, and as a result of their own scientific work became its otagonists, that the heliocentric system was seriously con-dered. Indeed, it can only be said to have been finally lopted by the scientific world as a whole as a result of the ork of Newton.

It is necessary for us to remember, therefore, that at the ne when the creeds of the Reformation and the Counter-eformation—those Protestant and Romanist Confessions nich are still the standards of organized Christianity to-day—ere formulated, the geocentric system was unquestioningly cepted. The Earth was regarded as the only world, the end nd aim of creation round which all the heavenly bodies re-olved, and for the benefit of the inhabitants of which the Sun nd been created to illuminate the day and the Moon and ars to mitigate the darkness of the night. To this view the eformers clung as tenaciously as the Inquisitors. Luther, in s usual pugnacious style, referred to Copernicus as a fool no dared to contradict the Bible, an 'upstart astrologer' who et his own authority above that of sacred Scripture.' Melanch-on gravely deplored the lack of decency of those who set rth such theories; while Calvin clinched the matter, as he

thought, by putting the scathing question—'Who will venture to place the authority of Copernicus above that of the Holy Spirit?'

These efforts to stem the current of human progress were about as efficacious as the legendary attempt of King Canute to stay the flowing tide. During the past three centuries the history of astronomy has been the record of the continuous extension of our knowledge of the Universe both in space and time, and the Cosmos which confronts the astronomer to-day is inconceivably vaster than the tiny world familiar to the ancients and regarding which the learned men even up to the seventeenth century believed themselves to know so much. Certainly the outstanding fact which the study of astronomy drives home upon our minds with irresistible force—the truth which strikes even the juvenile enquirer as he reads for the first time such a book as Ball's *Star-Land*—is the vastness of the visible Universe. The Earth, which our forefathers believed to be the centre of all things, is shown by modern astronomy to be but one planet among others revolving round the Sun; and when we realise the magnitude of the Sun and of the greater planets, and the vastness of the distances separating the various worlds from the Sun and from one another, we understand how insignificant a role our world plays even in the Solar System. The Earth is the centre, not of the Universe, but of a little sub-system within the greater Solar System—the Terrestrial or Earth-Moon system. Only in comparison with the Moon does the Earth appear large and important; and our satellite is the one astronomical body which is comparatively close to us. Only 238,000 miles—a mere trifle so far as celestial distances go—separate us from that mass of matter which appears to be after all, to quote the picturesque phrase of Flammarion, nothing but a 'detached continent.' The small domain over which our Earth holds sway is less than 500,000 miles in diameter, and when we are dealing with thousands of miles, we are still within the realm of the conceivable.

When we come to consider the magnitude and distance of the Sun we find ourselves projected into a new world of size and distance altogether. In volume this mighty globe exceeds our Earth 1,300,000 times; and while we measure the distance of the Moon in thousands of miles, our unit for the interplane-

ary distances is the million. The mean distance of the Earth from the Sun, as every schoolboy knows, is 93,000,000 miles. But this is one of the smaller distances in the Solar System, for the Earth is comparatively close to the Sun. Neptune, the outermost known planet, revolves at a distance of 2,700,000,000 miles, so that the Sun's domain—leaving out of consideration the orbits of the erratic and unstable cometary bodies—is over 5,000,000,000 miles in diameter.

The eight primary planets fall into two distinct groups. They have been designated as the outer and inner planets, and this is a convenient classification; but they may be grouped also according to their size and physical condition, and following up the recent classification of the stars, I have suggested that the two groups should be designated the giant and dwarf planets respectively. Into which of these groups does our Earth fall? Not into the giant group. Jupiter, Saturn, Uranus, Neptune vastly exceed our world in size—the volume of Jupiter being 1,300 times that of the Earth. The only position of dignity which our world may be said to occupy is the primacy among the dwarf planets, being slightly larger than Venus, considerably larger than Mars, and much larger than Mercury. The Earth, then, may be defined as a dwarf planet revolving round the Sun.

The Solar System, vast though it is, is not co-extensive with the Universe. The astronomers of the eighteenth century, preoccupied though they were with the motions of the planets and the verification of the Newtonian law, realised this in a dim, vague kind of way. But it is to the elder Herschel that the world owes the pioneer work which has issued in our present-day cosmology. His discovery of the motion through space of the Sun, carrying with it the Earth and all the planets and their satellites, indicated the essential kinship of the Sun and the so-called 'fixed stars,' some of which were even in Herschel's time known to be in quite rapid motion. And within the past sixty years, the spectroscope has proved beyond a doubt that there is nothing unique about the Sun. It is simply a star, one among a vast number—75,000,000 at a minimum estimate, and 1,000,000,000 at a maximum. Its importance to us consists simply in the fact that our Earth is one of its small satellites. Intrinsically it is not important.

One of the broad generalisations of modern astronomy is that associated with the name of Professor H. N. Russell, of Princeton. Professor Russell finds that the great mass of the stars fall into two well-defined groups, which he designates as giants and dwarfs. While the giants—which form the majority of the brilliant first-magnitude stars which are familiar even to the casual star-gazer, such as Antares, Betelgeux, Aldebaran, Arcturus and Rigel—are tens and hundreds of millions of miles in diameter, the diameters of the dwarfs are to be measured in hundreds of thousands of miles. Not quite four years ago, the astronomers at the Mount Wilson Observatory, in California, succeeded in measuring the diameter of the bright star Betelgeux, which they found to be 273,000,000 miles. Some time later they found that Antares is a still mightier star, its diameter being no less than 430,000,000 miles. And just the other day Dr. Shapley, the director of Harvard College Observatory, announced that in all likelihood the giant stars in the Nubecula Minor are still larger, some of them about a thousand million miles in diameter. These amazing facts show us that the Sun, vast though it is relatively to our little world, falls into the group of dwarf stars. It is a large dwarf, certainly, but a dwarf nevertheless. So our Earth's status in the Stellar System proves to be that of a dwarf planet revolving round a dwarf star.

The vastness of the material Universe is perhaps still more forcibly impressed on us by the distances which separate the stars from one another. The nearest stars, the bright first-magnitude double star, Alpha Centauri, and the tiny dwarf Proxima, which seems to be physically connected with it, are distant twenty-five billions of miles. So distant are these stars, indeed, that light, which travels from the Moon to the Earth in a second and a half, and from the Sun in eight minutes, requires four years for the journey. And these Centaurus stars are our nearest neighbours. The familiar brilliants of our evening sky are situated at much greater distances. The nearest of the giants would appear to be Vega, about thirty light-years away—a light-year is about six billion miles—while the super-giants, Antares and Betelgeux, are distant over one hundred light-years away. At still greater distances are the

familiar cluster of the Pleiades, and the bright groups which we know as Ursa Major and Orion. These appear to be at least six hundred light-years away.

The researches of Professor Shapley have resulted in a still further extension of our knowledge of stellar distances. Astronomers at the beginning of the century estimated the diameter of the entire Stellar System at about 10,000 light-years at the outside. But Dr. Shapley some years ago discovered in the dense star-clouds of the Galaxy faint blue stars, evidently giants, which cannot be nearer than 15,000 light-years. Sixty thousand light-years away from the Sun is the centre of gravity of the Stellar System, while the whole great assemblage of stars has the shape of a flattened disc, about 6,000 light-years in thickness and about 300,000 in diameter—a hundred thousand times greater than was supposed at the beginning of the century. Outside of this main sidereal system there are subordinate or satellite systems—'island universes,' using that designation in a literal sense. By mutually confirmatory methods, Dr. Shapley has fixed the distances of eighty-six of these globular clusters. The nearest is 22,000 light-years away, and the most distant 220,000. Not so authoritative, perhaps, is an estimate made by the same astronomer of the distance of a still more distant outlying cluster, which he has computed to be a million light-years, or six million billion miles.

The vexed question of the finitude or infinity of the physical Universe, or rather the question as to whether it is limited or unlimited, remains unanswered. What we call the Stellar System is most certainly finite, but whether or not it is but one island amid myriads of others we do not know. The spiral nebulae, which about ten or twelve years ago were thought by many astronomers to be external galaxies are most probably not so, but truly nebulous masses. If certain deductions from the Einstein theory be reliable, space—at least that space with which we are familiar—is finite. Einstein has indeed fixed an upper limit—a maximum extent of the space-time continuum, 1,000 million light-years in circumference. But even if this is so, if the space we know in association with matter is 'finite yet unbounded,' we have no reason to believe that it exhausts

the All. It may be but a temporary manifestation. There may be more than poetry in Shelley's fine words:

> 'What is heaven? A globe of dew,'
> A 'frail and fading sphere,
> With ten millions gathered there
> To tremble, gleam and disappear.'

And if we are confronted by virtual illimitability in space, we are faced no less with virtual limitlessness in time. Religious people even a hundred years ago were accustomed to think of the world as six thousand years old. Archbishop Usher fixed the date of the creation of the world out of nothing, declaring for about four thousand years B.C. Dr. John Lightfoot, Vice-Chancellor of Cambridge University, one of the most erudite seventeenth century scholars, solemnly calculated the date of creation as the month of October, 4004—man being created by the Trinity on the 23rd of that month at nine o'clock in the morning. By the mid-nineteenth century, Lord Kelvin fixed a maximum of 20 million years for the life of the Sun, with a shorter period for that of our world. His estimates, however, have been rendered obsolete by investigations in the realm of stellar evolution and by the recognition by physicists of the hitherto disregarded factor of inter-atomic energy. Dr. Shapley's study of the physical condition of the stars in the nearest cluster, 22,000 light-years away, and the most distant system separated by 220,000 light-years, indicates that the stars in the one cluster appear to be at the same stage of development as the stars in the other, though the light from the one cluster has been so much longer on its way than the light from the other. Two hundred thousand years, then, is a negligible quantity in the life of a star—a mere tick of the clock. Hundreds and thousands of millions of years have been required for the evolution of our own world. Possibly a billion years is the unit of time in the life history of a star. Finite it may be, nevertheless the visible Universe presents to the mind of man an impression of incomprehensible vastness alike in space and time. 'The spirit of man acheth with this infinity,' as Richter truly said. Flammarion does not overestimate the truth when he says, 'Such is the aspect, grand, splendid and sublime, of the universe which flies through space before the dazzled and

stupefied gaze of the terrestrial astronomer, born to-day to die to-morrow on a globule, lost in the infinite night.'

It must be confessed that the first effect of this impression of vastness must be one of unsettlement. Little wonder that conventional theologians fought this new cosmology long and fiercely. The new cosmology does not, as they thought, contradict the Confessions and the Creeds, but it somehow renders them meaningless; for the Power which the cosmology and cosmogony of to-day alike hint at is as much greater than the God of the Council of Trent or the Westminster Assembly as the Universe of to-day is wider than the Universe of Luther. When Shelley said of the God of the Jews, or rather he might have said the God of the Oxford theologians of the early nineteenth century, that 'the works of His fingers have borne witness against Him,' he was not blaspheming, however unfortunate the tone of those immature notes to 'Queen Mab.' He was simply stating the actual conclusion to be derived from the impact of modern astronomy on scholastic theology, and particularly on crude theories of the Atonement. I do not know of a better statement of the bearing of modern astronomical concepts on our theological outlook than the words of Dr. Beard in his Hibbert Lecture on 'The Reformation in relation to Modern Thought and Knowledge.' 'How shall we rise to the thought of Him who is the Lord of innumerable worlds, the Ruler of the boundless spaces, the Master of the Eternal years? Did then God, and such a God as the all of things prove He must be, die for us? I say it with the deepest respect for the religious feelings of others, but I cannot but think that the whole system of Atonement, of which Anselm is the author, shrivels into inanity amid the light, the space, the silence of the stellar worlds.' And what Dr. Beard says of Atonement is true of much of our theological thinking on miracle, Christology, eschatology. While it is true that scientific and religious knowledge are in the last analysis incommensurable, it is also true that he who has in any real sense grasped the import of modern cosmology will hesitate before he maintains that in the subsidiary dogmas of theology we have absolute truth or that they are more than imperfect formulations, relative to our experience.

Is it accurate, then, to say that the foundations of faith are cut away from us in 'the height, the depth, the gloom, the glory?' Does our spark of being wholly vanish in the depths and heights? By no means. Our cursory sketch of the visible Universe must have left on our minds certain impressions.

I. The most definite impression is surely that this stupendous system of stars and worlds is not self-explanatory. As a prominent American astronomer said about a year ago: 'My own deliberately formed judgment, purely personal, not susceptible of proof, perhaps, is that so tremendous a cosmos must have divinity in it or over it; my reason rebels at the assumption that it is purely materialistic, the result of the chance concentration of self-created physical forces.' The old cosmological proof of the divine existence is no longer valid, it is true, as a logical proof. At the same time the Universe as a whole does strongly suggest that it is not self-explanatory. 'The cosmological argument,' as has been well said by Professor Upton, 'when it takes the shape of asserting that a unitary ground and cause is needed to account for and render intelligible this entire infinite series of dynamic activities and phenomenal changes which constitute the Universe rests still, I believe, upon a solid foundation of logical necessity,' or as another philosopher has said with equal truth, 'The earliest assumption of human thought, that an adequate producing power is implied in the existence of what we see, is also the testimony of the visible Universe, with its immeasurable vastness and its infinite variety.' And even as the universe is immeasurable, its fundamental cause is immeasurable. The Universe is a manifestation of immeasurable power—of that 'Infinite and Eternal Energy,' before which even the professedly agnostic Spencer stood in awe and reverence. The primitive emotions of wonder and worship which the star-lit sky aroused in our ancestors it still arouses, only the wonder and worship are heightened and deepened by the assured results of modern astronomy.

II. But astronomy reveals to us other aspects of the Universe besides vastness, and from these aspects we have something to learn. Without making any illegitimate assump-

tions, we can glean something further from the starry heavens concerning the Power beyond.

Modern astronomy has demonstrated the *oneness* of the Universe. When Newton formulated his law of gravitation he showed that the Sun and the planets formed one system, that the Earth and its fellow-worlds were members of one family, performing their revolutions in obedience to one law. And when, in 1802, Herschel discovered the binary stars, it was further proved that the Stellar System was one family, and that throughout the whole Stellar System masses of matter obeyed a uniform law. Further, the modern branch of astronomy known as astrophysics has still further emphasized the kinship between the Earth and the Sun on the one hand and the stars on the other. The dark lines in the solar spectrum tell unmistakably of the existence in the solar atmosphere, in gaseous form, of the very elements with which we are familiar here upon Earth —sodium and potassium, calcium, iron, hydrogen. The day-star is akin to us, bone of our bone and flesh of our flesh. And while it is profoundly true that 'one star differeth from another star in glory,' the same chemical elements are yet to be found in the atmospheres of giant and dwarf stars alike. These elements exist in different proportions and under varied conditions of temperature and pressure, but their presence is clearly demonstrated by the faint lines in the stellar spectra. Matter, then, is subject to the same laws in the most distant parts of the Universe as here on Earth. The same laws hold sway and the same processes are going on. The new physics does not speak of gravitation as a force, but as a property of space, but whatever gravitation may be on the ultimate analysis, it is cosmos-wide in its scope. What we look out on from our vantage-point on Earth is a unified Universe—one in law, one in substance, one in process. Given the same condition, the same results will follow. And in passing it may be observed we cannot but be struck by the absurdity of believing that only on one small speck of matter has the cosmic process resulted in what we know as life and intelligence. Apart from the interpretation of the mysterious markings on our neighbour world Mars which the keen eyes of Schiaparelli and Lowell discerned and which, it may be, seem to hint at the existence of cosmical cousins out there in space,

the plurality of worlds would appear to be the necessary corollary of the oneness of the Universe. Even if, as some astronomers think, there are no planets revolving round the double stars, even if the Solar System had an unusual origin, even if only one star in a thousand can ever be the centre of a system of planets—all of which are highly controversial propositions—we are faced with the likelihood that life has appeared in many different regions of the Stellar System. The bearing of this on the dogmas of orthodox theology is obvious.

The Universe, then, is a Universe and not a multiverse, and if we are permitted to say that the system of the stars speaks to us of Power immeasurable, we can with equal legitimacy infer that it speaks of one Power. It is at theism and not at polytheism, at one Creator, not at many, that the Universe hints; and certainly not at a limited or finite God.

III. Further, the Universe is quite evidently an ordered Universe. A cursory glance, it is true, indicates chaos and confusion; but with the progress of science, this chaos and confusion gives place to order and harmony. For instance, the seemingly hopeless tangle of the planetary motions was resolved into the simplest of systems by the formulation of the Copernican theory. The apparently complex motions of the planets are the sum of the motions of the individual planets plus that of the Earth; and the actual movements are the necessary consequences of the Keplerian and the Newtonian laws. The motions of the stars are much more complicated, but since the time of Herschel it has been evident that the Stellar System will one day yield up the secret of its structure. Just as in the Solar System, so in the greater Stellar System the stars are concentrated to the plane of the Galaxy or Milky Way. And in recent years much progress has been made in unravelling the apparently tangled skein of the stellar motions. One of the greatest discoveries of the century has been the detection, chiefly through the labours of Kapteyn, Eddington and Dyson, of the fact that the stars in the vicinity of the Sun belong to one or other of two great streams of stars moving in opposite directions—a fact which seems to find an explanation in the tentative cosmology of Dr. Shapley, who views it as the effect of the mingling of two clusters of stars, to one of which our

Sun belongs. It may take many decades or centuries before the construction of the Universe is even approximately known, but the problem is obviously not insoluble.

What, then, does the fact that the Universe is an ordered Universe teach us? That ultimately the Universe is understandable. And if we are entitled to say that the Universe speaks to us of Power, and of one Power, we are no less justified in saying that the Power hinted at is not blind Power, but a Power based on reason, whose thoughts, in Kepler's fine phrase, we think afterwards in the process of discovery.

IV. We are, I think, entitled to go a step further. Astronomical science tells us a little more. When the average man thinks of evolution, he thinks of biology and Darwinism and Mendelism, of the struggle for existence and the origin of species. But, truth to tell, the first hint of evolution which the mind of man received was not from the Earth beneath, but from the heaven above. In the closing years of the eighteenth century the idea dawned on the mind of Herschel that some at least of the faint filmy nebulae which his great reflectors revealed in such lavish profusion were masses of primeval world-stuff, from which the stars were in the course of ages evolved. And Laplace, contemplating the finished article before him, namely, the Solar System, reasoned backwards to a time when the Sun was a vastly extended nebula, and when this world was a 'fluid haze of light.' After many vicissitudes the idea of the development of stars out of nebulae was finally accepted in the last half of the nineteenth century and is to-day established on unassailable foundations. That the primeval world-stuff is believed to be exemplified in the dark nebulous matter of which the luminous nebulae are but exceptional specimens does not invalidate the nebular hypothesis in the least.

The classification of stars according to their physical condition, which the invention of the spectroscope rendered possible, gave the clue to Vogel in 1874 that a spectral classification might be taken to represent the order of stellar evolution. And while particular systems of classification have come and gone, there can be no doubt that the vast majority of the stars in the sky can be arranged spectroscopically in an evolutionary series. The theory of Professor Russell divides the stars into

the two classes of giants and dwarfs—the former being great gaseous masses in process of contraction and still growing hotter while the latter have passed the meridian of stellar life, and are still contracting but growing cooler, as our Sun is doing. But the mere fact that the stars can be arranged in an evolutionary sequence from the simple to the complex, from the shapeless cloud of cosmical dust to the steady star, fitted to be the centre of a system of worlds, strongly suggests purpose, cosmos-wide in its scope. What Professor Arthur Thomson says of the organic realm is equally true of the inorganic—'Only a system with order and progress in the heart of it could elaborate itself so perfectly and so intricately. There is assuredly much to incline us to "assert Eternal Providence and justify the ways of God to men."' If the universe hints at the existence of a great causal Power, one Power, one understandable Power, it hints as strongly that this Power is working with purpose according to plan.

I venture to say that while there is not, and in the nature of the case cannot be, any logical proof of the existence of God, the Universe revealed by modern astronomy gives us this impression of Power, one Power, one wise Power, one wise purposive Power behind all phenomena. I believe that the facts of astronomical science are not only not hostile to Christian Theism, but that the queen of the sciences is in a very real sense the handmaid of faith. The God of the scientist, to quote a notable sentence of John Fiske, the disciple of Spencer, 'is still and must ever be the God of the Christian, though free from the illegitimate formulas by the aid of which theology has sought to render Deity comprehensible.' Theism—Christian Theism—has nothing to fear from astronomical science, but rather much to gain by the assimilation of the assured results of astronomy. While a little knowledge may be conductive to atheism, as Bacon truly observed, 'much natural philosophy and wading deep into it will bring about men's minds to religion.' With our vastly extended intellectual horizons we of the twentieth century can confidently endorse the words of the familiar hymn:

> 'In reason's ear they all rejoice
> And utter forth a glorious voice,
> For ever singing as they shine,
> The hand that made us is Divine.'

BIOLOGY AND RELIGION

By Professor J. S. Haldane, M.D., LL.D., F.R.S.

THOUGH I am not a Churchman, I have been asked to give a short paper on the relations between Biology and Religion. Except in so far as biological conclusions come into conflict with certain details of theological creeds, there is on the surface no evident contact between biology and religion; and so far as conflict with those mere details of theological dogma exists, I should have little else to say than to give whole-hearted support to well-founded biological conclusions. I think also that probably the great majority of those present here would agree with me, though I am well aware of their difficulty in reconciling their position with much that is set forth in existing creeds and church-services.

It is not, however, about biology and theology that I wish to speak, but about biology and religion. For religion the world, whether visible or invisible, is the manifestation of God. The real basis of religion lies in our own conscious experience, in our awareness of values which determine the course of our existence and unite us all, but which cannot be regarded as derived from either individual or collective self-interest. In so far as we realize these values, their objective validity, and their unity, we acknowledge, whether we are aware of it or not, that our universe is a spiritual universe, and the manifestation of one God.

The theories of natural science seem to recognize neither objective ethical values nor God. Yet many scientific men have been deeply religious, and in one way or another, have, even if unsatisfactorily, reconciled their science with their religion. With the progress of science in recent times such reconciliation has seemed to become more and more difficult, and the existence of spiritual reality in the sense implied in religion has seemed to become more and more shadowy. During the nineteenth century this process was very marked; and it was particularly the progress of biology, and only to a minor

extent that of historical criticism, that brought the difficulty to a head. I shall endeavour in this paper to indicate what seems to me the cause of the difficulty, and to maintain at the same time that, however uncompromising the attitude of biology is, and I hope always will be, towards obsolete details of theological creeds, there is in reality nothing to come between biological science and real religion.

Perhaps we can best realize the cause if we call to mind the argument of a once popular book, Paley's *Natural Religion*. Paley argued that, firstly, the human or animal body is a piece of exquisitely perfect machinery; and that, secondly, the existence of this wonderful machinery is clear evidence of the existence of a supernatural Designer. His argument was not very original, but it was at any rate put with great clearness. The first step came to be accepted by the great majority of physiologists, but the second step was invalidated by the discovery of evolution and the theory of natural selection. It is, however, to the first step that I wish to draw your attention; for the essence of the whole matter is there.

Granted that the body is a machine, Paley would have said that the soul is placed within to control its voluntary working. Nevertheless, the more the matter has been investigated the more clearly has the fact seemed to emerge that the conscious control of the machine is dependent on exactly the same sort of material conditions as its ordinary unconscious working. We need only, for instance, reduce the oxygen supply, or cut off the supply of some substance supplied by a gland, to produce not only loss of normal conscious control, but a condition akin to, or identical with, idiocy. If, therefore, the body depends upon mechanical conditions, so also does the mind or soul. Moreover, moral and mental characters are just as clearly transmitted by ordinary generation as bodily characteristics. In Paley's time, and indeed for long afterwards, many physiologists, known as vitalists, believed that there is active in the living body a factor which they called vital force, and which is independent of the mechanical conditions. But the arguments just quoted are fatal to vitalism also.

Paley's first step, taken in conjunction with the further development of physiology, thus leads us straight towards

what is called materialism. Consciousness becomes a mere mysterious accompaniment of mechanical processes; and spiritual values have ultimately no more meaning than they can have in a purely physical world.

Paley was a product of his time. With his generation, and succeeding generations, he accepted the assumptions about the nature of visible physical reality which had come down to him from Galileo and Newton. These assumptions were that visible reality consists of self-existent bodies separated from one another in self-existent space and time, and acting on one another according to the definite laws of mechanics, physics and chemistry. The human body, as a part of visible reality, must be just as much subject to these laws as inorganic bodies.

But Newton's conclusions about visible reality were based on the observation of inorganic phenomena. They seem to fit these phenomena, or at least seemed until recently to fit them, though Newton himself was far from thinking that he had done more than make a beginning of applying them in detail. But do they fit the phenomena of life? If they do not, then Paley's first step was a false one, and the materialistic arguments which have so naturally grown out of it fall to the ground. From the purely scientific standpoint of biology itself the question is a fundamental one. No one can doubt that the conception of a living organism as a mechanism such as Paley depicted is to a very large extent useful and convenient; but is such a conception consistent with the characteristic phenomena of life and conscious behaviour? To this scientific question I have largely devoted myself since my student days, and perhaps writings of mine on the subject may be known to some of my audience.

I have recently been engaged in editing for publication the scientific writings of J. J. Waterston. Waterston was a distinguished pupil of the physicist Sir John Leslie, and early in life was also inspired by contact with Faraday, who belonged to the same small religious community as he had been brought up in. He went out to India as Lecturer to the naval cadets at the East India Company's establishment at Bombay, having selected this post as one which would leave him plenty of leisure to develop his scientific ideas and make experiments. He sent his work home for publication, but unfortunately he had

shot so far ahead that none of his scientific contemporaries understood him, and he died, practically unknown, at Edinburgh in 1883. Eight years after his death the manuscript of one of his rejected papers, containing a full statement of the afterwards accepted kinetic theory of gases and of temperature, was discovered in the Archives of the Royal Society by the late Lord Rayleigh, and published in the Philosophical Transactions, with a thoroughly appreciative introduction. Lord Rayleigh, however, did not discover the most important of his other writings, published but disregarded and forgotten, or still in the Archives of the Royal Society in manuscript. When they are made accessible it will, I think, appear that Waterston was one of the very greatest physicists of last century, and that the failure of his scientific contemporaries to understand him was a calamity to science, and particularly to the reputation of British science.

One of the earlier of Waterston's writings was a short book entitled 'Thoughts on the Mental Functions.' In his student days at Edinburgh he had studied anatomy and physiology, and become greatly interested in psychology. The book was the outcome, thirteen years later, of his work in these subjects. It may be described as a determined attempt to see in what sense, and to what extent, human and organic behaviour can be regarded as a physical and chemical process. His conclusions are significant. He found that nothing known of physical and chemical properties could explain this behaviour. He dismisses with contempt ordinary mechanical explanations, which he calls 'the miserable shifts of ignorance, and only to be excused in an infant state of the science.' Waterston is, so far as I know, the only great physicist who has directly considered from a physical standpoint the characteristic features of human and organic behaviour. The judgement which he reached, coming as it did from a man of his extraordinary insight into what he called 'molecular physics,' now called physical chemistry and thermodynamics, is significant.

If we observe the relation between physiological stimulus and response, we find that under standardized or 'normal' conditions of environment the response follows the stimulus as regularly as any physical effect follows its cause. But when

the conditions of environment are altered, perhaps to only a very slight degree, this is no longer the case: the response is altered, perhaps totally prevented or 'inhibited,' to use a physiological term. The exact response of a limb, for instance, to a stimulus, say a visual stimulus, acting on the body, depends on a host of stimuli varying in nature with the relative positions of the various parts of the body: depends also on endless other co-existent stimuli, whether visual or of other kinds. It is just the same with chemical stimuli acting on any part of the body whatsoever.

When we regard this phenomenon from a wider standpoint we see that we can with very considerable success predict what happens if we assume that the life of an organism is something which actively asserts and maintains itself, including the organism's relations to its environment, in a manner which is specific or 'normal.' The responses and their modifications or inhibitions then fall into intelligible order. Apart from this assumption, characteristic physiological responses are nothing but unintelligible chaos: we cannot predict the characteristic manner in which stimuli and responses become associated and effective. It is just this point which Waterston laid his finger upon.

That the parts and activities of a living organism occur relatively to one another is evident. The very nomenclature of biology is evidence of this. Relativity reigns supreme in biology. But not only is this so: the relationships of life actively assert and maintain themselves. The responses of the nervous system become intelligible from this standpoint; but this is still more evident in connection with the simpler responses within the body to molecular stimuli—the responses connected with respiratory exchange, assimilation and secretion. It is with these responses that my own experimental work has been mainly associated, and the study of them has left no doubt in my mind of the necessity for regarding the already defined conception of life itself as fundamental in biology

Perhaps this necessity will become more easy to understand if I refer to the basis of practical medicine on its therapeutical side. When the organism in injured by any passing cause, tissues of exquisite delicacy have been destroyed or

altered in structure. We have no means of repairing or replacing these structures as we might repair or replace the injured parts of a machine. Nevertheless, the injuries can be recovered from, and by various means we can facilitate the process or render it certain. It is because life actively maintains and reproduces its normals that recovery is brought about. What a doctor does is merely to aid Nature in the process. Any other view of the matter amounts to the mere quackery which has been repudiated by scientific Medicine ever since the time of Hippocrates.

But I can almost hear some well-meaning scientific colleague saying, 'Your conception of life may be all very well as a sort of heuristic principle, but it is totally unintelligible. The process of healing and reproduction must depend on a series of molecular reactions; and the right way to understand it is to investigate these reactions one by one. Since the living body is material it must be subject to the laws of all material action. In other words, it must be a mechanism, though a very finely balanced and complex molecular mechanism.' Let us then suppose for the moment that this is so, and see how the assumption works out.

The living body reproduces itself from generation to generation. In the process of reproduction it grows from a microscopical speck, or rather two microscopical specks, the male and female elements, which have united to form one. Little or none of the assumed molecular machinery can exist in these specks: it must all be gradually built up again in the course of development. This development itself is a very complex process, which on the mechanistic theory would necessitate the existence of extraordinarily complex molecular machinery in the germinal specks, and corresponding machinery in the parent organisms for producing the germinal machinery. The mind recoils from the incredible complications involved.

Specific germinal cells in the bodies of animals can sometimes be followed in their successive divisions from one generation to another, and in this sense there is continuity of the germplasm. On the mechanistic theory, therefore, the molecular machinery of reproduction reproduces itself by fission from its like. But how is a delicate piece of machinery to reproduce

itself by fission? Imagine the unspeakable confusion in such a process or in the sexual fusion of two of the pieces of machinery!

I have perhaps said enough to show why I cannot regard the mechanistic theory of life as tenable. It involves quite impossible assumptions and leads us nowhere in respect of the characteristic phenomena of life. Not only the newspapers, but scientific men, continue to speak of the mechanism of life and heredity: I confess that such an expression has no meaning whatsoever to me. We cannot dispense with the distinctive conception of life. Let there be no mistake, however, about what this implies. It implies that the old conception which Galileo and Newton set forth of visible reality has broken down; and that there is no use in appealing to that conception in support of a mechanistic theory of life. Life would be entirely unintelligible on that conception; but it is reality that science has to deal with, and not an ideal world of mechanism. The ideal mechanical world of Galileo and Newton corresponds sufficiently well for most practical purposes with our experience of inorganic phenomena, but does not correspond with our experience of biological phenomena. The supposed self-existent bodies and separable reactions of the ideal mechanical world have turned out to be not really self-existent and separable; and we have to modify our fundamental conception of visible reality accordingly, though for many practical purposes the merely mechanical conception may suffice.

This conclusion throws a new light on organic evolution. It was formerly assumed that as we trace life backwards to its simpler forms we are tracing it towards a primitive world of physical mechanism. This is not the case. We are really tracing life into what we had wrongly assumed to be a world of physical mechanism. It may be many years before the significance of the phenomena of life for our conceptions of visible reality are generally understood; but assuredly this general understanding will in time be reached.

So far I have only discussed life in such a form as we seem to meet with in plants, or in the activities of parts of our own bodies which we assume to be unconscious. I now come to conscious activity. We know that conscious action is in our-

selves, and we can easily infer its presence or apparent absence in other persons. We can also form some judgement as to its presence in even lowly organized animals.

Conscious is distinguished from unconscious experience or activity by the fact that a conscious experience or action carries with it an ordered reference to both past and anticipated experiences, as well as to other present experiences. It was Kant who first pointed out this fundamental fact clearly in relation to perception. A conscious experience not carrying in itself ordered relations to past and anticipated experience is a purely imaginary figment. This discovery constitutes the great advance which Kant made beyond Berkeley and Hume. We cannot derive our conceptions of the spatial and temporal orderliness of our world from separate experiences of it: the orderliness is already given in any experience, and belongs to it. An ordered universe existing apart from conscious experience of it would be nothing to us. It was to a world of relativity that Kant's analysis of perception led.

At first sight Kant's idealism seems to lead us into impossible or practically unmeaning conclusions; but let us follow the same line of reasoning further than Kant followed it. He belonged to his own time. The order which he found to be implied in conscious experience was simply the order of the physical world as pictured by Galileo and Newton; and indeed his idealistic philosophy became a sort of buttress to their ideas of visible reality. Whether visible reality was self-existent, or relative, or ideal, did not seem to matter much in practice, although with relativity physics Kant's reasoning has now come into prominence among physicists themselves.

When we examine our own conscious experiences and actions we find that they hang together in another manner besides those pointed out by Kant. They hang together or are essentially related in the manner already described in connection with the phenomena of life. Whether we will or no they influence and inhibit one another in a manner which cannot be predicted or understood on merely physical principles, and which only becomes more or less predictable or intelligible in the light of the conception of life. What Locke called the secondary qualities in experience come under this category,

together with various natural appetites and instincts, repulsions and attractions. Into all our conscious perceptions and actions this element of relatedness enters, and not merely the relatedness in a physical sense, to which Kant drew attention. Both in connection with ourselves and with other organisms is this true. It is only by a process of artificial abstraction that we can neglect the biological aspect of our conscious experience.

We must not make the mistake of supposing that the conception of life stops short at the body-surface of an organism. A living organism cannot be separated in thought from its environment. In life the physiological relation to environment is maintained just as clearly as the physiological relation between the parts of the body. An organism belongs to its environment just as much as its parts belong to one another. Different individual organisms are also organically related to one another, by parenthood, sex relations, and mutual association of various kinds. The normal limits in duration of individual life are also an apparent evidence of this relationship.

In consciousness of the biological aspect of experience, and in corresponding conscious action, our lives have for us a past and future which are inseparable from the present. Our perceptions and actions are thus those of conscious interest, as distinguished from the blind immediacy of what we regard as mere biological phenomena. Our world is a world of interests and values, and our actions have a corresponding responsibility attached to them.

The existence of biological phenomena showed us that a mere mechanical conception of visible reality is fundamentally inadequate, however useful practically for some purposes. The progress of philosophical investigation since Descartes has also shown us that in whatever way we may for temporary practical purposes represent to ourselves the visible universe, it cannot be in reality anything but a universe of conscious existence. Berkeley, Hume, Kant, and their lineal successors have been in agreement about this, however short they may have stopped in the further development of their conclusion. Putting together this conclusion with the previous one, we find

that our universe is a universe of perceived interests and values, and of responsible conduct.

Let us now examine further the nature of the interests and values which present themselves in perception and conscious behaviour. We can think of them in the first place as the interests of an individual human organism. In the life of a conscious organism what is required for the maintenance of its normal organic life and structure is foreseen and provided for in the light of past experience, since conscious experience and action reach out, as Kant showed, into both the past and the future. In this process the environment is as much concerned as the body of the organism itself, since life, when we investigate it, involves, and indeed manifests itself in, a normal relation between living organic structure and environment. This fact is to some extent masked in higher organisms, which possess, in the form of their blood, an internal environment which by various means is kept amazingly constant in its character, and acts as a sort of buffer between the living tissues and the variations in the external environment; but now that physiologists have become aware of this, the true relations between organism and environment are standing out ever more clearly. It is a relationship which can only be comprehended as an organic one: a merely physical interpretation of it is not possible. Even from the standpoint of our merely individual lives our environment is in no mere physical relationship to us; it is bone of our bone and flesh of our flesh.

An isolated individual human organism is, however, only a scientific abstraction: for without at least a mother or nurse no human infant could survive. In the perception, more particularly, of human relationships and corresponding actions, we become aware of wider interests than those centred round our individual organisms. The wider interests centre round family, countrymen, the human race, and extend also to animals, plants, and country. They extend also to both the past and future. In the experiencing of them it is just reality itself that is being revealed to us; and spiritual reality, not merely ideal scientific abstractions. We are, in fact, no mere self-centred beings, complete in ourselves; and those who set before themselves, and endeavour to act on, the idea that they

are entirely self-centred, are only doing violence to their own nature.

This latter conclusion seems to me equally clear even if we simply regard human behaviour from an abstract biological standpoint. A higher organism is an assemblage of countless individual cells; but the behaviour of not one of them is intelligible biologically apart from its relations to the rest, and to the environment generally. In exactly the same way the biological behaviour of individual human organisms is unintelligible apart from their relations to other human organisms and the rest of their environment. Their very being in the biological sense manifests itself in this relationship. We belong in the most intimate sense to our environment.

The wider interests which reveal themselves in human society have a compelling power which dominates what we regard as mere individual interests. In these wider interests we meet with something which we can in this sense describe as 'not ourselves,' though in another sense it is the reality of ourselves. It binds us together in spirit, so that what others feel and see we also feel and see. We thus attain to what we regard as objective perception, a perception that others share in, and that unites all men: also to corresponding objective standards of behaviour.

This perception and behaviour is not just the collective or average perception and behaviour of a number of individuals, but something which only shows itself in fellowship with others, and in the contemplation of our relationship with Nature. It is the manifestation of the spiritual Reality of our universe—the Reality which men call God.

We are so accustomed to regard reality as physical reality in the sense of Galileo and Newton that any more adequate conception of reality seems to us far away and unreal—mere mysticism. We are the children of a materialistic age. We look for a soul consisting, if not of ordinary matter in the mechanical sense, yet of something which is only a thinly-veiled imitation of it. We look, also, for a similarly constituted God. Such entities can never be found. God is with us, in us, and everywhere around us, as Jesus taught. We must learn to see spiritual reality, and not the mere appearances of a material

world. We must learn, also, that the voice of God is not a voice threatening us from outside with material punishments or coaxing us with the hope of material rewards, but a voice which, when we hear it, transforms our very most hidden motives and thoughts.

Let me return to the relations of biology and other branches of natural science to religion. Perhaps it might seem that what I have been saying attributes to natural science the responsibility of blinding us to spiritual reality. Are not, for instance, Galileo and Newton, and the great biologists who have treated the living body as if it were a piece of mechanism, responsible in this respect? To point out that theologians are equally responsible does not answer this question. I wish to consider it directly.

When we examine the original contributions of great men of science we always find, firstly that on the data before them their conclusions were justified, and secondly that these conclusions were calculated to be of great practical use to their fellow-men. If it is true that the reality of our universe is spiritual, it is no less true that we are constantly struggling with illusion and imperfection, and that it is only in that struggle that spiritual reality manifests itself to us. We cannot separate faith from works. The motive of science has always been the discovery of what, in one way or another, will be of use; and at every turn we make use of scientific discovery in practical affairs. It does not matter how limited in scope the discovery may be, we can always make use of it. To take instances, the discoveries by Kepler of the mechanism by which images are focussed on the retina, or by Harvey of a mechanical process by which blood is circulated through the body, were limited in scope, but of immense practical service. The eye cannot be regarded as a mere mechanical structure, nor the circulation as a mere mechanical process, so there is a reality beyond these discoveries. This does not, however, detract from their value, any more than the discoveries of Einstein have detracted from the value of Newton's discoveries.

Scientific investigation is just part of the struggle in which spiritual reality manifests itself; and the realization of this brings science, particularly pure science, very near to religion.

It is only when science becomes dogmatic that it assumes an attitude which seems to deny the existence of spiritual reality. We find very little of this dogmatism in the writings of great men of science, but much more of it in the desiccated science of systematic text-books and popular expositions. For instance, the idea is spread abroad in such writings that natural science, unlike philosophy, advances by a steady process of addition. We have only to look back on the history of natural science to see how utterly misleading this idea is. The progress of science is just as much strown with the remnants of discarded theories as is the progress of philosophy, but, in spite of this, continuity of development is evident in the histories of both of these subjects. Surely it must be the same with theology.

During most of my life I have been struggling more or less with scientific dogmatism, but I have never before addressed an audience mainly clerical. As you have been good enough, or rash enough, to ask me to do so, I wish to take the opportunity of adding my voice to those of others who are engaged in struggling with the shackles of theological dogmatism. There are very many who, like myself, are kept away from existing Churches by dogmas which they cannot honestly countenance, and perhaps a still larger number who are actively hostile because they regard churches as hot-beds of superstition. If I thought that my country could get on equally well without churches I should not care what was taught in them. But I do not think so. We need to be constantly reminded of that spiritual reality which manifests itself in willing service of every kind, and without the perception of which our country would relapse into chaos.

The churches cannot afford to be hampered by unintelligible beliefs which are mainly materialistic accretions of Christianity, and which greatly weaken its influence on those who are worth influencing. Religion itself stands on ground which cannot be assailed: it has no use for rickety defences. The story of Jesus and His teaching appeals to all men, and influences them practically, because it touches what is deepest and most real in them. There are many, however, who feel forced to conclude that that teaching was based only on emotional illusion. Hence adequate philosophical or theological support is needed

for it. This support should be based on the widest philosophical and scientific knowledge. Any shirking of the questions involved, or cowardly sheltering behind mere traditional authority, is fatal. If I know my countrymen, I know that sooner or later they will cease to tolerate such methods. The true function of a Church is to help men to see reality as a whole and guide their actions accordingly, thus preventing social chaos, intellectual confusion, and artistic decay.

You are members of the national Church of England, and we are meeting near the spot where one of the greatest leaders of that Church, a man of English yeoman stock, met his end. It is to Latimer that my mind goes back when I appeal for intellectual freedom in the English Church. He stood, not only for social justice and humanity in his country, but also for intellectual freedom. It was not of his own sufferings, or his own soul, that he spoke as he was dying, but of the England he had served so fearlessly, so lovingly, so faithfully, thus finding oneness with God.

The candle which was lighted in England as Latimer and Ridley perished is still burning.

AUTONOMY OF LIFE AND MIND

By Professor C. Lloyd Morgan, LL.D., D.Sc., F.R.S.

IN what I have to say there is probably much that, running counter as it does to certain prevalent currents of modern thought, may not enlist your sympathy. But you doubtless wish me to speak frankly. I am one of those who believe that, subject to the conditions of what we call time and place, all world-events—those which fall for consideration under biology and psychology, no less than those which fall for consideration under physics and chemistry—are susceptible of naturalistic interpretation in an evolutionary plan of orderly advance. But I none the less believe that this evolutionary plan of events has spiritual significance and betokens the presence of God.

On this preliminary confession of faith there will swiftly ollow the question: How can a naturalistic interpretation vhich includes life and mind in its evolutionary purview have nything in common with an interpretation of religious experi- nce which shall elucidate what is meant by spiritual signifi- ance? Are not mind and spirit one in essential being? If this e so, and if mind be a natural product of evolutionary process, s not the spirit of man—nay, more, is not God also—engulfed n naturalism? Not so, if, as I contend, mind should not thus e identified with spirit. Permit me then to distinguish, with ome of my betters, body, mind, and spirit, and to urge that we, s persons, are not only embodied minds, or enminded bodies, ut are also spiritual beings. I ask that this usage of the word spirit' be borne in mind.

Our natural world is very complex and comprises a vast nultitude of events. Emphasis on events implies that it is a going concern.' It seems, however, that, in this or that set of vents, the 'go' is in accordance with some plan of which those articular events which fall under observation are instances. We say that all natural events are determinate; and by this we nean that the manner in which they go or run their course is in ccordance with some plan. That gives us a number of different lans. But some of us cannot rest content with this. We want o know what is the determinate plan, evolutionary or other, of ll these different plans. I use the word 'evolution' in the nrestricted sense sanctioned by Huxley (*Essays* i, p. 102).

If such there be—if there be one comprehensive plan in ccordance with which all natural events go, have gone, and vill go—this plan does not come and pass in the same sense hat current events come and pass. It may no doubt be said hat the plan develops; but if it develop in accordance with lan, *that* plan must just be the plan that it always and every- vhere *is*. It is, in a valid sense, omnipresent and timeless, hough the particular events in passage are here and now.

But the question still remains: What *gives* the go of events nd the plans, or the one comprehensive plan, on which they un their course? I may assume that at this Conference, this uestion is specially pertinent.

Now it seems to me—though there is difference of opinion—that there has arisen a division of labour. One set of people, the men of science, elect for their field of work, enquiry into the way in which events go on this or that plan, the laws of which they seek to discover; and they say: What makes them go or what gives the general plan is no concern of ours. Another set of people, the philosophers, elect for their field of work, enquiry into that further question with which the men of science have no concern; and they say: What is no concern of yours, as men of science, is our concern as philosophers. You deal with go and plan as you find them; we enquire by what agency (spiritual or other, but for us here spiritual) they are given.

This division of labour, under the headings of science and philosophy, as thus distinguished, may work smoothly and well; but only, as I think, on the understanding that all events are placed on an equal footing. If either party claim that some events are on one footing, whereas other events are on a quite different footing, trouble is sure to arise. There will be controversy over the 'difference of footing' and what this means; there will be further controversy as to what events are to be placed on this footing and what events on that.

If we follow up the division of labour a little further, we find that, in the field of science, there is sub-division of labour. Some men of science enquire into the manner of go of physical events, including all those that occur in the body—including, therefore, physiological events. Other men of science enquire into the manner of go of psychical events, including those that run their course in the mind. Neither has any concern with agency; for that, under the broader division of labour, belongs not to science but to philosophy. Each may say: I have quite enough on my hands in rendering a clear account of the go of events and the plan on which they run their course; that is my proper business. But the physiologist may say: No doubt *some* of the events that I study are in *some* way connected with *some* psychical events; while the psychologist may say: No doubt *some* of the events which I study are in *some* way connected with *some* physiological events; and each may add: None the less, physiology is physiology, and psychology is psychology. Each is self-contained with its own regulative laws. In this

nse each claims to be an autonomous province, though in me respects, and in some way, there is connection of some of e events within both provinces. Here again there is likely to trouble over 'some.' I urge that the word 'some' should be itted; and that the statements should run: *All* the events hich, as physiologist, I study, are connected with psychical ents: and *all* the events which, as psychologist, I study, are nnected with physiological events. That leaves open further quiry as to the connection of *these* events with *those*. The ords 'in some way' are redundant, for if the events be con-ected at all, they must be connected in some way.

We thus lead up to the concept of unrestricted correlation. it be accepted no controversy arises over 'some events,' since l alike are interpreted (1) in this physiological regard and (2) that psychical regard. In each regard there are distinctive ws of autonomous sub-plans of events. But they are corre-ted within the evolutionary plan which includes both. Under b-division of labour physiologist and psychologist pursue eir several enquiries in such wise as to reach harmonious re-lts. As men of science, however, they are nowise concerned th agency. They just accept the go and the manner of go of ents in two-fold regard, physical and psychical—let us say in dy and in mind.

If then the philosopher on his part seek to adduce evidence support of his further concept of agency, he too should do without any restriction. He should not say: Some events, ychical and physical, demand this concept for their adequate terpretation; he should say: All events, without any reser-tion, demand the concept of agency—for us here and now iritual.

Our theme is autonomy. And, so far, I have done no more an suggest that there is a sense in which we may speak of the tonomy of life, of mind, and of spirit, each with distinctive ws of its own. I take it that autonomy connotes certain intrin-laws of the constitution of that which is said to be autono-us. Any given organism combines autonomy in physical and psychical regard, each with its own distinctive laws under ich the plan of events is determinate. But any group of or-nisms which are closely interconnected, such as a family or

a social community, also exemplifies autonomy in so far as ther is what we speak of as self-government within it. It is thi intrinsic factor that the concept of autonomy emphasizes. Bu there are also extrinsic factors—the physical influence of othe organisms, other families, other communities, and mental refer ence thereto common to individual members of the group. Henc in speaking of autonomy we must define that 'entity' of whic it is predicated as intrinsic, and state clearly in what respect we predicate that autonomy which renders the entity in questio in some sense self-regulating. Now when we speak of th autonomy of life and mind, the stress is on a distinguishin feature which is attributed to some entities and not to other The word 'some' is here quite legitimate, since we now dea with a classification of entities to which distinguishing feature are attributed. I am not fond of the word 'entities'; but I kno not how to avoid its use. The evolutionary story, as I read i is that of natural entities—that is, of integral clusters of event of which autonomy in some sense may be predicated. Let u briefly consider in what evolutionary sense.

To this end, allow me to use two words, 'stuff' and 'sub stance,' with specialized meaning involving a radical distinc tion; asking that, whatever may be the history of its philoso phical or its popular usage, the word 'substance' be here take in the sense that I must try to make clear. Much turns on th concept.

Take any inorganic entity of integral status—an atom, molecule, a crystal. Each has a definite constitution. Unde analytic treatment there are a number of items of stuff, observ able or inferable, which go together in a specific mode of sub stantial unity. The distinctive type of unity within the give entity I speak of as substance. The items of stuff are many an discrete. The substance is one and indivisible. Of this or th item of stuff one may say: Now here and then there in th structure of the entity. But the substantial unity is always an everywhere. It pervades the whole entity so long as it is i being.

Thus there are, to quote Sir William Bragg:

> three types of assemblages of matter. The simplest is that of th single atom, as in helium in the gaseous state, in which the behavio

of every atom is on the whole the same as the behaviour of any other. The next is that of the molecule, the smallest portion of a liquid or gas which has all the properties of the whole; and, lastly, the crystal unit, the smallest portion of a crystal (really the simplest form of a solid substance) which has all the properties of the crystal. There are atoms of silicon and of oxygen; there is a molecule of silicon dioxide, and a crystal unit of quartz containing three molecules of silicon dioxide. The separate atoms of silicon and oxygen are not silicon dioxide; in the same way the molecule of silicon dioxide is not quartz. The crystal unit, consisting of three molecules arranged in a particular way, is quartz.

Here we have an ascending hierarchy. On the first level the items of stuff in the atom are proton and electrons; they go together on a definite plan of substantial unity. On the second level the items of stuff are atoms; and they go together on a new plan, one in substance. On the third level the items of stuff in the crystal unit or cell are molecules; and they here go together (are 'arranged in a particular way') in yet higher synthesis in virtue of a still richer mode of substantial unity. There is, as we ascend, increasing complexity of stuff and increasing richness in substance. And the go of top-level events includes that of events at lower levels, subject to modification entailed by the higher substantial synthesis. What the man of science compendiously speaks of as 'a substance' (generally taken in bulk) comprises the stuff also; but the emphasis is on substantial unity. Furthermore, the new entity (or the new substance in this sense), the atom of silicon or oxygen, the molecule of silicon dioxide, the crystal unit of quartz, have, respectively, quite new intrinsic qualities, and quite new extrinsic properties in relation to other entities. And this newness in each case seems just to come—to spring into being. It is, in G. H. Lewes's terminology, *emergent* and not *resultant*—that is, not merely the algebraical sum of sundry old qualities and properties. It is something genuinely new in evolutionary advance.

Now in so far as any new entity affords an instance of a constitutive plan with new intrinsic principles of self-regulation it exemplifies autonomy. Thus there are ascending stages of autonomy to which both stuff and substance contribute as participants in its intrinsic nature. There is autonomy in the atom, in the molecule, in the crystal unit, and in its first cousin, the colloidal entity.

When we pass from inorganic to organic entities along a specialized line of advance in the evolution of colloids, life dawns on the scene. I accept as the most probable scientific hypothesis that it has come in a manner analogous to the springing into being of the atom, the molecule, and the colloidal unit. Certain primitive physiological events are the new items of stuff which go together in a new mode of substantial unity. Even in the simplest organism with which the biological deals, there are many constitutive life-events; but the substance in each several organism is one and indivisible so long as the integrity of the living entity is preserved. In the course of development of one of the higher organisms there is increasing complexity of life-stuff and increasing richness in substance.

The alternative hypothesis in the field of scientific enquiry is that the organism is not a genuinely new entity—that there is evidence only of *resultant* complexity of physico-chemical stuff; no evidence of a new mode of substantial unity that betokens emergence. The question is purely scientific; as to the answer there is difference of opinion. I believe that the mode of substantial unity is genuinely new. If so, if it be emergent and not only resultant, the organic entity, without ceasing to be physico-chemical, has its own substantial constitution, *sui generis*; and it therefore affords an instance of a higher form of autonomy—that of life.

When we pass from life to mind we consider living beings in psychical regard. Under unrestricted correlation all life-events, as dealt with by the physiologist, are also psychical events which fall within the province of the psychologist. Any integral system of diverse life-events which go together in substantial unity to constitute an organism, however lowly, is likewise a system of psychical events which go together in its kind of substantive unity. Now we may apply the word 'mind' to any such psychical system—say in the amoeba. Then we may say: Any life-system is also a mind. Or we may restrict the word 'mind' to a psychical system when it reaches some assignable status. Then we must say: This or that life-system, highly developed in such and such ways, is correlated with a psychical system which affords evidence that it has reached the level of a mind. If the latter usage be accepted,

we need some criterion of mind in this restricted sense. I think we should emphasise conscious guidance of life-events as affording such a criterion. But under naturalistic interpretation this conscious guidance is nowise independent of, or disparate from, physiological control in certain higher nerve-centres. It is in psychical regard what that control likewise is in physiological regard.

Here it may be said that neither 'control' on the part of certain nerve-centres, say in the cortex of the brain, nor so-called 'conscious guidance' as the psychical correlate of the physical events that run their course therein, can have any meaning apart from the concept of agency. But quite obviously, on the thesis I advocate, they have meaning for the biologist and for the psychologist, each in his province of enquiry. Men of science are not wont to use words without meaning—of course, suitably defined.

With conscious guidance (to lay stress on psychical regard) there emerges a new change in the manner of go in natural events. Let us start with the fertilized ovum. There follows embryological development. That, we say, is a matter for the biologist and the physiologist to interpret. The psychologist bides his time. He may say: No doubt concurrently with this bodily development there is psychical development. But in the restricted sense of the word, there is as yet no mind; for there is, in the embryo, no evidence of that conscious guidance —that new manner of go—which is for the psychologist the distinctive criterion of mind.

Thereafter, in due season, the child is born. The psychologist watches its behaviour. Even in a day or two he finds evidence of conscious guidance on the part of the infant. What kind of evidence? In brief, that the manner of go of events on subsequent occasions differs from the manner of go on this or that first occasion—that the child profits by the lessons of experience. As a matter of observation there is avoidance of certain situations the like of which have entailed discomfort; there is clinging to those situations which have been pleasurable. Such progressive clinging or aversion (of gaze) is well seen in the development of vision. The stress is on repetition under normal biological routine so as to give subsequent occasions

with conscious guidance hitherto not in evidence. It seems, then, that the first indications of such guidance may be interpreted as involving some *present foretaste*, on the later occasion, of the pleasure or pain that this or that mode of behaviour will entail. This is distinctly psychological in that certain occurrences have prospective reference. It belongs to the autonomous province of mind. But it has physiological correlative.

It must, of course, be realised that there are thousands of physiological events in his body, the psychical correlates of which, though they largely contribute to the child's enjoyment in living, are seemingly nowise subject to any conscious guidance on his part.

Now follow up the child's development. Till the age of two years or thereabouts there is little or no evidence of any form of conscious guidance save what we may call orientation of behaviour towards that which is pleasurable. But somewhere about the age of three years there begin to take form *plans in mind*—the child's own plans in the child's own mind—in anticipation of further behaviour. Conscious guidance with an end in view, is raised at this new turning-point of evolutionary advance to a higher level. There is a new orientation to new forms of pleasure of a much richer order which I distinguish as *joy*. There is joy in the fulfilment in action of the anticipatory plan in mind; sadness in its frustration. There is now orientation, in a frame of values, towards fuller and richer forms of joy.

I cannot here defend this thesis with its emphasis on joy, aesthetic, intellectual, and moral, as superseding mere pleasure, far lower in the path of advance. What I seek to make as comprehensive as brevity permits is that, as the outcome of observation and interpretation of what we claim to be natural events there are three main levels of psychical evolution; (1) a primary level at which there is no evidence of conscious guidance; (2) a secondary level at which, under a lower form of guidance, there is orientation towards what we may broadly speak of as the animal or infantile forms of *naïve* pleasure; and (3) a tertiary level of what we commonly call rational procedure based on anticipatory plans in mind and oriented to-

wards those progressively higher forms of joy which are the richest product of mental evolution. But events at all the three levels thus broadly distinguished run their course together as terms of stuff in substantial unity one and indivisible.

It may here be said: You beg the question at issue when you baldly assert that, at a certain stage of mental development, plans in mind just come into being or emerge; for the point of emphasis is that only through the agency of mind do they thus come on to the scene of events. But at a far lower stage of evolutionary advance does not molecular constitution, or crystalline architecture, just come on to the scene? To what agency is *this* coming due? It may be replied that this is merely part of the world's inorganic 'mechanism.' Does this mean that it comes through no agency? Not necessarily so, it may be said; but not through the agency of life and mind. It is the presence of *this* mode of agency, with evidence of purpose, that marks the autonomous province of life and mind properly so-called. I must ask one more question: Does this mean that in the inorganic world there is no evidence of purpose? Or is it some other purpose; or is it purpose in some other sense?

In the sense of the word 'purpose' which the psychologist, as man of science, accepts, it betokens a plan in mind with end in view; it is only in evidence when there is what I spoke of as rational procedure at a very late stage of mental development in evolutionary history. Such is human purpose of which there is evidence, say, from the age of two and a half years onwards. But we must now ask: Does embryological development afford evidence of such purpose on the part of the fertilized ovum? I say, No; for that would imply in the embryo an end in view based on a plan in mind. And this is far beyond the capacity even of a boy of five—perhaps beyond that of an embryologist of five-and-twenty. Is this, then, what we are asked to accept by those who advocate the autonomy of life and mind 'in the proper sense'? It seems so; for we are told that at the dawn of individual life there is mind. We are told that even then the future outcome of development is an end in view; that there is endeavour to attain that end; that there is choice of means appropriate to the realization of this plan in

mind. What mind? It seems to be that of an agent specially invoked *ad hoc*.

The thesis is familiar and need not be stated in detail. If I am unable to accept it; if I venture to express the opinion that this *ad hoc* mind of the fertilized ovum or of an acorn is reminiscent of primitive mythology; if I go further and state my conviction that, throughout the ages, mythology has contested the field of spiritual significance with religion as I conceive it; I do but underline what I said at the outset, namely, that the alternative thesis I have been led to accept runs counter to sundry prevalent currents of modern thought.

Along what lines, then, runs the very different interpretation I offer? It is no new one. In brief, the emphasis falls on the belief that spiritual agency is one and indivisible—operative always and everywhere—manifested in life and mind, yes; but also in the evolutionary foundations from which first life and then mind have emerged. It receives phenomenal expression in all that is susceptible of naturalistic interpretation. All that we call natural is due to one agency within one coherent plan and has spiritual significance in God.

But there must, as I think, be some common principle that is disclosed in all fields of interpretation, including that which deals with religious experience. I suggest that it may be found in the doctrine of stuff and of substance.

First, I submit that these concepts are applicable in psychical regard no less than in physical regard. Ideas, images, memories, percepts, are diverse items of the stuff of mind in objective reference. Correlative to these are the several acts of conceiving, imaging, remembering, perceiving, on the part of some person. And all these acts—nay more, all emotional modes of affective experience, all the thousands of items of *naïve* enjoyment as they come and pass—all the psychical correlates of all life-events within us—go together in the substantial unity which renders the personality of each of us one and indivisible. And although it is questionable whether there is in any social group, however closely integrated in substance, one *mind*, I submit that there is a valid sense in which one may speak of spiritual unity in a spiritual community—for the province of spirit is all-embracing.

On this view individual spirits are the items of stuff that constitute the spiritual community, and the efficient presence of God is its spiritual Substance in indivisible unity. As several and discrete items of stuff we are individual spirits, each with personality all his own. And yet as stuff of the spiritual community we are what we severally are only in virtue of the substantial presence of God, who gives unity to the Church, and in the chord of whose richer Personality our limited personalities are subordinate notes. For the essential feature of personality is substantial unity in its richest expression.

On this view the whole evolutionary plan, with what Mr. Alexander calls its upward *nisus*, is the manifestation of Divine agency, one and indivisible. All things, each in its finite degree, belong to the eternal temple of God; and there is no event in its passage 'through time and space' of which we dare to say that it has no spiritual significance. But in this infinite spiritual realm, all temporal and spatial limitations drop away. If we are, on our part, the spiritual items of living and enminded stuff that go together in love and goodwill with joy at its highest and best, we may at last reach out towards the inexhaustible concept of the eternal; and while we pursue our temporal course we may realize that the kingdom of heaven is within us and that even here and now we are immortal beings, since spirit is not subject to bodily disintegration or to mental decay.

Such, very inadequately but I hope not irreverently expressed, is a doctrine that lays stress on *all* and not *some*; such is the autonomy, as I conceive it, of the whole realm of spiritual activity—an autonomy wider than that of life and of mind; such is an avenue of scientific approach to religion—an approach only, but one that is consonant with religious experience, one that endorses and justifies, at the bar of philosophy, belief in the invisible Substance of God.

THE TIME-PROCESS, ETERNITY AND GOD

By W. G. de Burgh, M.A., Professor of Philosophy, University College, Reading.

I.

THE subject of my paper is in close relation to that of our discussion this morning. As one whose interest is primarily in metaphysics, I could not but feel, while listening, that behind all enquiries into the nature of the evolutionary process and its bearings on religion, lay the problem of Time. Only by aid of a reasoned theory of Time can philosophy hope to effect a synthesis either with religion or with the physical and biological sciences. The religious consciousness, whether taken in its primary form of intuition or in that of the conceptual interpretations of theology, holds firmly, for all its assurance of eternity, to the reality of the temporal process. If Time be an illusory appearance, religion is robbed of its incarnational principle, and the gulf between God and man remains unbridged. We know how, during the formative epoch of Christian theology, the mind of the Church clung fast to its historical foundations, and, resisting the speculative allurements of Gnosticism, vindicated the actuality of the temporal order as a divine creation, the scene for the manifestation of the Eternal Word and for the indwelling activity of the Eternal Spirit. In the natural sciences, on the other hand, the time-process is all in all. Not only the realm of human agency, individual and social, but that of organic life, and even of inanimate nature, is historical. The substitution of Motion for Matter as the basic fact of physics has entailed the integration of Space with Time, and the replacement of a geometrical by a purely dynamical explanation of physical phenomena. In biology, the belief in fixity of species has yielded to that in a contiuous evolution, of which the human mind, with all its powers of self-transcendence, is a sporadic, recent, and probably transitory product. Science no longer postulates, as did

Aristotle and Aquinas, a prior actuality as the precondition of the process from the less to the more developed. The Time-spirit unaided brings its own promise to maturity. Thus the relegation of Time to the limbo of unrealities, which seemed so simple to the thinkers of an earlier generation, is seen to involve a divorce between philosophy and science. This is one cause of the prevalent revolt against the Absolute Idealism, which since Hegel has dominated the philosophical horizon, and is still, through Mr. Bradley and the late Professor Bosanquet in this country, and through Croce and Gentile in Italy, a potent force in metaphysics. It has led thinkers as different in other respects as M. Bergson and Professor Alexander to posit Time as an ultimate reality, and to deny to the concept of eternity any place in a reasoned interpretation of the universe. But such a doctrine purchases a *rapprochement* between philosophy and the sciences at the cost of a breach between philosophy and religion. Religion, in demanding the integration of the timeless with the temporal, claims reality for both. Thus philosophy is confronted with the task of reconciling, on its own ground, the genuine actuality of the time-process with its dependence on a super-temporal reality. The issue is too large for adequate discussion in a single paper. But I want for a few minutes to survey it as a whole, and to indicate, by selective illustration, what appears to me a possible line of approach to its solution. I shall ask, first, how far the known facts, taken apart from the evidence of religious experience, reveal on analysis grounds for belief in a timeless reality; and, secondly, what further light is thrown upon the problem by the inclusion of that experience within the purview of metaphysics.

II.

Starting (*a*) from the idea of Time, it seems a paradox to say that it can only function as Time through fusion with that which is non-temporal. Yet such surely is the case. Time means succession, whether of instants or temporal stretches or events that occupy them; but, were this all, the universe would be a series of vanishing 'nows,' needing, as Descartes held, to

be recreated every moment. Since one fragment of the succession alone would exist, Time, absorbed in that fragment, would cease even to be succession, *i.e.*, would cease to be Time. Time, as experienced, involves not only succession, but continuity of duration. How can that which, as successive, perishes from moment to moment, also endure? In Professor Alexander's words, 'An instant could not be part of a duration, if there were no elements in it that were non-successive.'[1] Professor Alexander discovers the required element in Space, which is integrated with Time in the structure of primary reality. Granting that, in physical nature at all events (whatever may be true of mind), Space and Time are interdependent, I fail to see either how Time diversifies into points the blank extendedness of Space or how Space avails to save the instants of Time from perishing. They seem to function like Box and Cox, each admittedly 'playing the part of identity to the other's diversity.'[2] In any case, the presence of a non-temporal factor is necessary to the being of Time. The Time-order cannot be a term in its own series. It is no figment of the imagination, but a constitutive feature of reality. The fact of change implies that which changes not, but endures through the succession of its changes. I suggest that this duration-aspect within Time is the impress of its source in the eternal, that Time, whether taken as a substantial entity or as a relation of events, is, in the great phrase of Plato, 'a moving image of eternity.' Such a view helps us to understand how past and future, as well as present, exist with their distinctive modes of being; a truth to which the historian bears witness, by his interest in the past as such, apart from its issues on the present. 'Every epoch,' wrote Von Ranke, 'belongs immediately to God; and its worth rests, not at all on that which results from it, but in its very existence, in its intrinsic self.'

Time reveals its abstractness by its failure to reconcile the two factors essential to its being; it is a whole that remains for ever incomplete. We are led on (*b*) to consider what occurs in Time. We see before us a world of concrete existences,

[1] *Mind*, October, 1921, vol. 30, p. 411.

[2] *Space, Time, and Deity*, I, 60.

ranked in a hierarchy of graded forms—material bodies with physico-chemical properties, living organisms, minds, human self-consciousness—forms which, science tells us, have arisen historically in the course of the evolutionary process. Within each of these more obvious grades of development, a multitude of qualitatively different levels can be distinguished. It seems as if, all along the scale of being, the continuity demanded by science and by philosophy were broken by sudden bounds, as in the leap of electrons from orbit to orbit in the atom when light is emitted, or, at the other end of the scale, in the sudden conversions of religious experience, the catastrophic revolutions of history, and the flash of inspiration in the poet's mind that transforms the accumulated inheritance of the ages into an original aesthetic creation. Facts such as these form the basis for the theory of 'emergent evolution,' developed independently in recent years by Professors Lloyd Morgan and Alexander. At critical moments new qualities and relationships emerge from pre-existing materials, chemical properties from complexes of physical matter, life from physico-chemical compounds, mind from living organisms that have evolved a specific complexity of physiological structure. Each new character, when it arises, exercises a directive influence upon the materials on a lower plane; the movements of the artist's hand are still movements, amenable to physical interpretation, yet differ widely as movements from those of the insect, the plant, or the electron. How are we to regard these emergent qualities? On the one hand, they are no mere additive resultants, deducible *à priori* and predictable by mathematical calculation from our knowledge of the lower levels from which they spring; if this be what is meant by mechanism, a 'mechanistic' theory of life or mind is surely inadmissible. Nor is it necessary to postulate a life—or mind—force, invading nature, in Aristotle's phrase, θύραθεν, 'from without,' as certain 'Vitalist' writers in biology seem to suggest; were such the case with life, it must be so also with mind and other emergents, and the multiplication of occult entities becomes intolerable. Such procedure recalls the *vis dormitiva* of Molière's quack physician and the 'substantial forms' of a degenerate scholasticism. Nor can we call a halt even at the level of self-conscious mind; for human experience,

and especially that of religion, testifies to a *nisus* towards a yet higher grade of being. A hypothesis, to be adequate, must account, not merely for an intermediate phase of the process, but for the process in its entirety. Are we not driven to postulate an immanent teleology in nature? The appeal to the idea of purpose, thus understood as intrinsic to the universe, has no terrors for science. The time is long past since it implied the external adaptation of nature to human ends, which provoked the witticism that 'God created the vine to furnish wine for man, and cork-trees to provide corks for the bottles.' It is true that we cannot prove the presence of such a purposive activity. As far as experience goes, the emergent qualities must be accepted as brute fact. This is what science does and finds sufficient for its special requirements. But philosophy cannot rest content with such acquiescence, nor with the alternative hypothesis that the process of development is due to chance. Its faith in the rational order remains unshaken even by predictions of the eventual doom of mind and life on our planet. Reason itself points to the postulate of what Professor Lloyd Morgan calls a 'directive activity,' of which 'the manner of going in all natural events' is the embodiment.[3] Such an activity cannot be an emergent term in the series. Immanent throughout, it is the Alpha and Omega of the world's history, at once the completed plan and its temporal fulfilment. The timeless factor, disclosed by analysis of the idea of Time, here shows itself to be no static or inert background of change, but an indivisible act, unfolding itself creatively in the succession of emergent characters.

The idea of purposive activity, as we were told this morning, points forward to that of value. Value comes clearly into view when we pass to consider (*c*) human experience. Man is an ideal-forming animal, whose thought and conduct alike are guided by standards of truth and goodness. We have noted how all nature has the power of self-transcendence, in that, as Spinoza affirms, its *essentia* is its *conatus*, the endeavour, not merely after self-preservation, but towards a higher plane of being. The *nisus* towards deity is a fact in the evolutionary process. Significant of man's nature is its comparative free-

[3] *Emergent Evolution.*

dom from the limits that restrict this endeavour on lower levels; in conscious thought, his vision reaches forward to the perfect, and, in a manner, surveys the time-process in its entirety. It is his distinctive privilege to view the universe *sub quadam specie aeternitatis*. Herein lies the justification for the anthropomorphism which, despite all efforts to grasp objective existence, necessarily colours his metaphysical and scientific outlook; he knows that within himself is the infinite and the eternal, and construes thereby the infinite and the eternal in the universe. *Sentimus experimurque nos aeternos esse* ('we have conscious experience that we are eternal'). We cannot follow out the many implications of this famous doctrine of Spinoza, of which our intellectual and moral experience alike furnish confirmation. The pursuit of knowledge and the moral life are temporal processes; truth is discovered, duty done, in a succession of historical acts. But both imply what is above and beyond Time. Take the judgement; its content involves universals, which, whatever be their mode of existence, are not events; while the act of mind holds together the diversity of content in an unbroken unity. Moreover, every judgement claims truth; and the claim implies consciousness of a perfect and timeless standard. It is not merely the judgements of logic and mathematics, but those of history, as that the battle of Hastings was fought in 1066, that, as Locke observed, are, if true, true always and can never become false. The like holds, *mutatis mutandis*, of volition. Purposive action has its temporal co-efficient; the end desired is desired at a given moment in my biography, and is realized in a course of temporal actions. But the timeless standard is immanent in my volition. Though, in willing duty, I must needs will it as *this* duty, here and now, in its particular spatio-temporal context; yet, in willing it, I will duty *universal*, whose context is irreducible to a sum of its particular embodiments. If I eat and drink to-day to the glory of God, God's glory, immanent in the transitory action, is not exhausted when I leave the dinner-table. This is, to my mind, the inexpugnable core of truth in the ethical theory of Immanuel Kant. Let no one explain away universals or ideal values as constructs of human imagination. It is full late in the day to fall into the quagmire

of Conceptualism. Nor would it be easy, on such a view, to explain how the mind, bereft of its foothold on reality, could frame such figments; or to account for the peculiar consciousness of necessity that attends our recognition of truth and duty. But, their objective reality once granted, there is involved therewith the recognition of the timeless in the temporal. That which appeared in the time-series in the form of order and duration, and in the evolutionary process as purposive activity, wins a new meaning in the light of our experience of values. We are led to account for these experiences as the fragmentary expressions of a single supreme source alike of being and of value, an *ens* which is *verum* and *bonum*, immanent in human life, yet also in this sense transcendent, that it is no aggregate of its temporal manifestations, but an individual and perfect whole. In other words, we are led to the Platonic concept of the Essential Form of Good. It is not possible for us, any more than for Plato, to establish the truth of this hypothesis, either empirically or by logical demonstration. It remains a hypothesis, to be accepted, if at all, by what Professor Lloyd Morgan calls 'acknowledgment'; that is, by an act of reasonable faith. But it is not ungrounded. It is a legitimate hypothesis of metaphysics, seeking, in accordance with the demand of reason, not merely to describe the universe, but to explain it as a systematic unity.

III.

In answer, then, to the objection, how can you conceive a reality that lies beyond our temporal experience? I appeal, first, to the historic argument, set forth so impressively and with such infinite caution by Aquinas, *i.e.* to the *via analogiae* and to *à posteriori* inference from the facts. Man's gift of self-transcendence, which is shared also in measure by the nature that environs him, enables him to catch glimpses of an order beyond his actual plane of being. The broken lights of the eternal, in the prism of the temporal, bear witness to its intrinsic character. Yet the lights are broken; it would be a contradiction, were finite mind to win clear vision of the infinite.

But, chiefly, I appeal to the evidence of the religious consciousness. Hitherto we have confined our attention to the knowledge that is grounded on the physical and mental sciences. At the point we have reached, we must go further, and consider the bearings of religious knowledge upon metaphysics. I shall assume that religion is not merely a practical discipline, but gives specific knowledge, an assurance of God by direct acquaintance, analogous, as Professor Alexander has pointed out, to our assurance of the existence of other minds. It is this primary knowledge of God, revealed in the act of religious worship, that is developed in propositional form by the science of theology. Here are data of a distinctive type, which philosophy, in its effort after systematic unity, is bound to take into consideration. The problem, thus raised, of the relation between metaphysical and religious knowledge is difficult, and I can only summarize what I have recently discussed elsewhere, *viz.*, that while the distinction is not absolute, since for perfect knowledge the two sciences would be no longer two, but one; yet, for finite mind at the actual human level, they remain, for all their intimate contacts and interactions, distinguishable lines of approach to final truth. Metaphysics is at once narrower and wider than religious knowledge; narrower, in that the latter appeals to the whole of man's nature, the former only to his intellect; wider, in that religion is concerned with a specific object, while metaphysics, as *scientia scientiarum*, is a 'spectator of all time and all existence.' The premises of theology, given in primary religious intuition, are distinct from those of mathematics, biology, or ethics; the philosopher takes cognizance of all alike. Let us beware of misleading antitheses, such as that of faith and reason, as though philosophy had not its faith and religion were irrational; or that of intuition and intelligence, as though logical mediation had no place in religious apprehension and metaphysics were wholly resolvable into processes of discursive inference. The point is that religious knowledge is never merely theoretical, but rather the response of man's entire personality to God's compresence. This personal relationship to God is an ἀρχή, or First Principle, which subsequent reflection serves to interpret to the intellect. While metaphysics studies impersonally the objective order of

the universe, in religion God is known by way of personal 'acquaintance' and 'enjoyment.'

Hence we feel no surprise if religious experience enlarges our horizon by revealing features of reality that are hidden or obscure for other avenues of knowledge. It would be strange if it were otherwise. The nature and extent of this enlargement is a question calling for collaboration between philosophers and theologians, especially at the present time. Here I will only note, in pursuance of the object of this paper, how the non-temporal activity, posited by metaphysics as the directive principle of nature, is apprehended in religion as a personal God, of whose eternal purpose the whole world-history is the enactment. Religious faith holds together in indivisible unity the thoughts of God as immutable and yet purposive, as timeless yet productive of temporal existence, as self-sufficient yet loving and touched by response to His love, as immanent in His creation and yet transcendent, the source and goal of all finite being. It finds no contradiction between His all-embracing providence and man's relative independence, as endowed with freedom to dissociate his will from, or to unite it with, the divine. There are difficulties here for the speculative thinker, approaching the facts of religion from the outside; but they hardly exist for the religious consciousness, which draws its life from the assurance that all that lives and moves in time is grounded in Eternal Love.

Nor are the speculative difficulties, when we face them, greater than those which beset other interpretations of reality. It is as easy as it is futile to adopt a purely negative attitude in philosophy, and reject each proffered construction in turn on the ground of its ultimate inexplicabilities. The criterion is rather the degree of positive coherence that it discovers in the world of our experience. A system is not proved self-contradictory because it fails to explain every feature in the universe. Can we point to any theory of error or of evil that has not caused searchings of heart even to its advocates? Or, to take the age-long problem of the One and the Many, the periodic revivals of Pluralism, by Leibniz, Herbart, and in our own day by Dr. MacTaggart, Mr. Bertrand Russell and Dr. Wildon Carr, illustrate how Monistic philosophies, in meeting the imperious de-

nand of reason for unity, have failed to do full justice to the claims of finite individuality. If we insist, in our endeavour to harmonize the rival systems, that the One, to be truly One, must unify a manifold, that the Many, to be truly a Many, must preserve their independence within the One, that, alike for finite selves and for the Absolute, being-for-self and being-for-other are indissoluble, it is by an act of speculative faith rather than of logical inference. May not these abstract doctrines of metaphysic be rendered, I will not say, luminously clear to the intelligence, but less difficult of acceptance, in the light of the concrete assurances of religion?

I am aware that the position here maintained, that philosophy can only justify the belief in a personal God by appealing to the specific experience of religion, is alien to the main tradition of Christian thought. Aquinas, for example, required that, prior to the acceptance of revelation, the *praeambula fidei*, such as the existence of God, should be established independently by rational demonstration. I feel diffidence is dissenting; but, speaking for myself, I am doubtful whether philosophy, thus restricted, can satisfy the requirement. The cosmological proof, on which, or on a form of which, Aquinas chiefly relied, has lost much of its cogency in the course of the last seven hundred years. Is it impertinent to suggest that the angelic doctor drew too rigid a line of demarcation between the fields of natural reason and supernatural revelation; that his view of philosophy was not sufficiently comprehensive, his view of religion not sufficiently incarnational? I prefer to take the ground that philosophy, apart from religious experience, is incomplete philosophy. The diverse forms of experience—perceptual, conceptual, aesthetic, moral, and religious—furnish their several data of knowledge, and have, all of them, a rightful claim to a place in the philosophic synthesis. This is not to say that philosophy must take religion as it finds it or accept uncritically the interpretations of the theologian. Even were this desirable, the divergences within religious experience would preclude such a solution. Metaphysics must preserve its autonomy, provided always that its conclusions are not such as to rob religion of its meaning. To do this would imply disloyalty to the empirical foundations on which metaphysical constructions rest.

Finally, when the evidence of religion is thus taken into account, the knowledge gathered independently from the data of the sciences gains fresh light, as indicative of the fuller knowledge of which religion gives assurance. The timeless activity, 'acknowledged' as the complement of the evolutionary process, is revealed as God's eternal purpose; obligation to the moral law as the service of God, which is perfect freedom. So too with the thinker, whose activity in knowing is at the same time discovery; with the artist, who feels his creation to be a revelation; with the lover, who is most conscious of self-realization in union with the object of his passion. The severance of finite selves from one another and from the world around them, which has already in these human experiences lost the rigidity that it presents on the plane of spatio-temporal materiality, is justified and overcome by a faith that finds the full fruition of personality in union with an indwelling and yet transcendent God. We cannot understand how God is at once one with, and other than, those spirits who share in His eternal Life. We recall the passage at the close of the *Divina Commedia* where Dante tells how to the redeemed in Paradise the union of the two natures in Christ is as self-evident as is, to our intelligence, the logical principle of Contradiction. Religion cannot prove these things, any more than can philosophy; but, like philosophy, it accepts experience: and this acceptance involves acknowledgments, which give concreteness to the concepts of metaphysics and illumine with spiritual meaning the common incidents of daily life.

THE REIGN OF LAW

By the Rev. F. R. Tennant, D.D., B.Sc., Fellow of Trinity College, Cambridge.

I WILL assume that the chief questions connected with the reign of law which are expected to be discussed are these: is the behaviour of Nature according to law compatible with divine providence? Does it strengthen or weaken the case for theism? And, how is the relation of law-abiding things to God to be conceived? In order that these questions may profitably be dealt with, it is necessary to consider what we would mean by laws, reign of law, and Nature. Perhaps in making that enquiry we shall have gone far to clear up the theological issues with which we are concerned.

Save for some gain in clearness of exposition it is needless, because irrelevant, to discuss the question how the conception of law, as applied to Nature, was derived. It may be granted, for what the fact is worth, that mankind would never have thought of physical phenomena happening 'according to law,' had they not first made laws for the regulation of their own behaviour; or, in other words, that the notion of physical law was derived from the civic or forensic notion, and consequently is of anthropic origin. But the origin of the conception of law, for descriptive or interpretative purposes, is less important and less relevant to the theological issues now before us, than the element of fact for the description of which the concept was borrowed. The idea of law may well be a human invention; its applicability to the world may for all that have been a discovery. Certainly before ever human laws were enacted, some constancy of connection between physical events must have been observed, however it may have been interpreted, and must have shaped human prudence. Whether this fact is aptly described in terms of analogy with human law-abidingness, is a less significant matter. For the meaning of 'law,' as the word is used in science, has little affinity with its

original meaning derived from the field of jurisprudence. There is thus much in common between laws of Nature and social legislature: as verbal statements both are man-made, and both admit of unmaking and remaking upon occasion. This fact, it may be observed by the way, suffices to show the absurdity of the once-entertained supposition that the system of physical law hitherto formulated can be taken to bespeak a fast-binding fate, a necessity in things, in due respect to which human spontaneity should bow itself out of existence, as so much illusion.

But in asserting physical laws to be man-made, or to be *our* descriptions in terms and concepts of our devising, such, *e.g.*, as mutual acceleration in one of Newton's laws, we must not assume that Nature's regularity, as distinguished from the conceptual formulas in which science describes it piecemeal, is also a human invention, the outcome of human selectiveness or interested attention, or an instance of 'the psychologist's' if not of the 'pathetic' fallacy. That may be or may not be, and opinions differ with regard to it; but it is not to be assumed.

In this fact that both alike are made by man, the likeness between civic and natural laws is exhausted. In other respects they differ. Civic laws are imperatives, and they presuppose human law-*givers;* they are prescriptions. Laws of Nature are not human prescriptions, but rather human descriptions, in so far as man in concerned in their making. He, however, is not the only factor in their making, though a necessary one. Laws may be imperative prescriptions of Nature to man's thought, and corrective of its errors.

When King Canute, from his chair on the sand, prescribed to the waves of the sea, they were impatient of prescription yet patient of law; unless indeed their law were the super-human dictation, 'hitherto shalt thou come, but no further.' Whether natural laws also imply a Law-Giver, ultimately, is one of the theological issues presently to be considered, but with which this preliminary enquiry is not concerned.

Leaving aside now the original meaning of 'law' as of no interest to us, we may proceed to enquire what 'law,' as a technical term in science and philosophy, does mean. We can distinguish two chief connotations which the word has com-

monly borne, and two which are very different. It is sometimes said that it is of of the essence of 'law' that it connotes necessity. If so, this must be because the term 'law' has been conventionally re-defined for the purpose of expressing that specific connotation, which is certainly not an element in the original, forensic, meaning. Civic laws, though imperatives of the 'Thou shalt not' kind, can be, and are, broken; they do not describe invariable sequences, nor do they coerce conduct. There is no necessity about their being obeyed. Necessity is therefore a wholly new idea which the word 'law' was arbitrarily appropriated to express. It was, in consequence of this importation of necessity into the idea of law, that there came to be talk of immutable laws, 'laws that never shall be broken,' such as were invoked in the nineteenth century to rule out miracle and providence as impossibilities. In this sense, a law does not merely assert unvaryingness so far as experience has as yet gone, but invariableness and unconditionality; it therefore embraces not only actual, but also possible, experience; it bespeaks a wider universal than what has been called 'the universal of fact,' furnished by simple enumeration or by problematic induction.

What necessity, as thus applied to propositions, is, cannot be defined; because it is too ultimate an idea. It is only to be recognised, when present, by its criterion of self-evidence to developed reason; or, in the case of an inferred proposition, through some formal relation, established or postulated by logic, to other propositions that are self-evident. There may thus be necessary propositions, the necessity of which is as yet not apparent. We encounter necessary truths in pure sciences, like mathematics. And so long as mathematics was deemed the paradigm of science, the ideal of all knowledges instead of merely ideal knowledge, or knowlege about ideas, it was natural for philosophers to entertain the notion that there can be similar necessary truth about actual or existent things, as contrasted with straight lines without breadth, etc.; and to believe that in Newtonian science such knowledge lay to hand. We now generally believe that if there be *any* such knowledge of actual things, things which are not posited by us like the defined entities of the geometer, but posited for us in sense-impressions

and their relations, it is so extremely scant and thin as to count for little. Physical science once seemed to contain necessary truth about the actual because physical properties such as inertia, only knowable through sense-experience, were surreptitiously smuggled into the stock of pure or *à priori* notions such as space, time and motion, where they really have no place. This rationalistic theory of knowledge may be said to have received its death-blow from Hume, who made it for ever plain that so far as we can know, there is no necessity about the happening, or the particular nature, of any brute fact. The necessary connection between propositions and ideas is one thing; the necessity of connection, if such there be, between actual happenings, is quite another. *Causa* is not identical with *ratio*, as had been naïvely assumed; indeed, it is nonsense to speak of one thing or event 'implying' another thing or event. There is nothing, *e.g.*, in the chemist's definition of arsenic to warrant the inference that arsenic will cause death. That arsenic causes death is knowable only by sense-experience: experience as to man as well as arsenic. The 'order and connection of things' is, then, not the same as the order and connection of ideas—or propositions. Nor is there any *à priori* reason that the two different orders *must* correspond, be the system of ideas never so clear and distinct and self-consistent. There may be correspondence, or there may not. Whether there is, and how far there is, can only possibly be found out by comparing the two—by experiment.

From what has been said, it will be plain that the conception of law as applied to actual Nature, or to brute fact, and yet as connoting necessary connection identical with logical necessity, was an invention only possible to the rationalist. Assuming his naïve assumption to have been a huge error, we may now exhibit the true principle after which rationalism had been groping, but which it had misinterpreted. This is, that *if* there is to be any natural science characterised by universality and necessity, any knowable reign of law, then there must be some sort of correspondence, other than identity, between *causa* and *ratio*; some sort of necessity or compulsion in the relations or activities of things corresponding to, but different from, the logical necessity of implication which sub-

sists only between propositions or what used to be called 'ideas.' *Whether* there actually is such science, is quite a different question. Kant, only partially aroused from his 'dogmatic slumber,' and still sleepy, assumed that there was: nowadays, there is scarcely a wideawake philosopher, logician, or man of science, who thinks so. For one reason, we have learned too much since Kant's day as to the nature of scientific induction, to be able to cherish the Kantian confidence. It is now established beyond question that induction is characterised by probability; and that the probability of the ultimate principles on which all derived inductions depend—the principles which, before the quite recent discrimination of them, were designated by the vague phrase 'Uniformity of Nature,' is in the last resort something alogical. Psychologically considered, it is non-rational or alogical human hope, expectation, or venture; metaphysically, it is two or three specific assumptions, essentially indemonstrable, as to the elementary constitution of the physical world.

Necessity (in things), as involved in that connotation of 'law' which is for the present under consideration, is thus a precondition of there being demonstrably certain and unconditional science. It is only the necessarily connected that logical thought can penetrate, that knowledge can know, that science can 'understand' or explain, or categorically predict, or deny to be merely contingent, despite appearance to the contrary. But, as I have said, it is nowadays recognized that we do not know of any such science of Nature, nor, therefore, of any unconditional reign of necessary law. The predictions and the explanations of science are not categorical, but problematical; they involve a large 'if.' That there has been, as a matter of fact, a certain amount of uniformity and of necessary connection between phenomena up to date, we have the best reasons to believe. That it is immutable or all-pervading, or unconditional, we have no logical grounds for asserting.

Thus the assumption of universal necessity or legality in Nature's course is a convention, postulate, or device. It is adopted because 'it is desired to make one wise': wise, that is, in the restricted sense in which science pursues wisdom. The scientific type of understanding or of rationality, it should be

remarked, is not the sole type; it is not even the chief factor in that vague and indefinite thing we call 'reasonableness,' which we invoke when we justify our adoption of one indemonstrable proposition rather than another because it is what we are pleased to call more probable, without knowing or caring what we then mean. There is a very large amount of presumptive knowledge, and of knowledge which counts most in practical life, that is quite different from the scientific type: which is not a matter of uniformities, identities, or of logical ratiocination. The understanding involved in it, *verstehen*, is a kind that is largely superfluous in rigorous science, where understanding is of the *begreifen* sort; and the things which we understand best, in the former sense, such as human conduct and the historical, are just the things which, in the latter sense, we understand least; and *vice versa*. Science, as I once heard Prof. James Ward remark, might well have finished her work [i.e. *begreifen*] and yet [as to *verstehen*] be a fool. It is essential to bear this distinction in mind when we assert that the conception of Nature's legality, in the sense of all-pervading necessary connection and penetrability by thought, is an assumption, a teleological device, for the desired end of understanding or analysing her structure; and that this pursuit has nothing in common with understanding or interpreting her meaning—an adventure in which science, as such, has no concern. The reign of law, if that means the subsistence of unconditional and necessary connection between natural events, is then an ideal and an idea: it is neither empirical fact, nor *à priori* truth, nor self-evident axiom, nor precondition of the possibility of experience, nor inference from anything logically certain.

Yet it is only when construed in this sense, I believe, that the attribution of law to Nature involves any difficulty to theistic belief. We shall do well, then, briefly to consider the chief forms which this unwarranted ascription of a reign of law to Nature has assumed.

We naturally recall first the use made of the idea of law for theological purposes, by the English deists, whose influence persisted throughout a considerable part of the nineteenth century. The deists are generally supposed to have been disciples of Locke; but such philosophical presuppositions as Toland

and Tindal vaguely exhibit were really rather those of rationalism of a Spinozistic type. In their horror of attributing anything of arbitrariness to the Deity, they allowed themselves to speak of laws which it 'was fitting' for God to observe. A system of laws, physical and ethical, was thus set up as existing or subsisting independently either of actuality or of God; an eternal *prius*, a form or mould into which being had to fit in order to be, or into which it behoved God to fit it. This is the old error of confounding validity with independent existence or actuality, descended from the ontological fallacy and therefore from the Platonic realism which hypostatised the *universale ante rem* as against the doctrine of the *universale in re*. The determinate does not presuppose pre-existing determinations, nor do happenings presuppose laws; but conversely, relations and laws presuppose, or—more correctly—co-suppose, actual things and happenings. As Boutroux has happily expressed it, 'laws are the channel along which rushes the stream of facts: these latter have hollowed it out, although they follow its track.' In the case of the existent and what is valid of the existent, there is no 'before or after other,' whether in logical or in temporal order. Either things are a law unto themselves —make their laws by their behaviour—or else they obey an external Law-giver. In any case laws apart from things behaving 'according to' them, are empty abstractions and nonentities. Of laws that cannot be broken, laws to which things must conform, science and philosophy know nothing. On the other hand, laws have obtained and do obtain; and they must have a sufficient reason, whether science and philosophy may please to concern themselves with it or not. Unvarying sequence or concomitance is not the same thing as necessary connection; and *post hoc* is by no means always identical with *propter hoc*. But invariable (or unvarying) sequence points to necessary connection somewhere, or at any rate to a sufficient ground; and laws that are not causal laws in some broad sense are, one may venture to submit, no laws at all of actuality. If we rule out an eternal *prius* of necessary law, we must also rule out the notion of ungrounded coincidence, of regularity that is not to be accounted for either by the nature of self-subsistent things or by the nature of the prime mover and Creator of things.

The reliance on ungrounded coincidence, to which I have just alluded, is generally met with in schools of thought to which the old categories of cause and substance are bugbears. Continuance in one stay, and efficient action, are the two conceptions with which philosophical iconoclasts have of late been most busy; consequently the poor harmless human subject, because he seems to possess both these philosophically abhorrent characteristics, has had a worse time in the twentieth century than had the idea of God in the generation succeeding Laplace. Similarly in physics, determination or necessitation has been retained (while its causal explanation has been eschewed) through resort to the idea of the 'deterministic system.' This is one of the neat creations of the mathematician; but here, as in other such cases, necessary truth is purchased at the cost of relevance to actuality. In a deterministic system, within which all proceeds according to law, the future states of a continuous process are as determinative of it as the past; yet our world is obstinately irreversible, and our science of it is nothing if not *pre*dictive. Again, the perceptual elements in this world are to a large extent not correlatable with numbers; though the deterministic system requires them all to be. For these reasons, our world is obviously not a deterministic system; and resort to that pure idea fails, like the notion of an eternal *prius* of self-subsistent laws, to describe the reign of law that our science may be said to know of. Both of these conceptions transcend experience. They are postulates of human invention; their applicability to our world is neither self-evident nor empirically demonstrable. They have no place in science which knows its own nature and minds its own business; they are ghosts which empiricism has laid, and they no longer haunt theology. Allusion to them may have served to suggest that laws such as science has established are expressions for the observed behaviour of things and are grounded in the nature of things. There are no laws about actuality that are not laws of either immanent or else transeunt causality in continuant things. Substance (or continuant) and cause, indeed, are not two categories but one; and one which is always presupposed in attempts to eliminate it either from natural philosophy or from psychology.

We may now turn to the other chief meaning of the word 'law': the meaning which the word bears in the inductive science of to-day. Physicists have for long been insisting that laws of Nature are not prescriptions of the *à priori* kind, but descriptions—of similarities, etc. As to their form, they are patient of remodelling as knowledge grows. They briefly subsume Nature's behaviour up to date and no further. A broken law is but an inexhaustive description. This term 'description,' as denoting the function of laws, has been taken in some quarters so seriously, with intentional antithesis to 'explanation,' that I may conveniently allude to a certain influential school as the 'descriptionist' school. Professors Karl Pearson and Poynting, James Ward and Hobson, may be cited as representatives of it. They do not all think exactly alike as to details; but they all agree that in electrons, ether, potential energy, etc., we should see no more than conceptional scaffolding, possessing perhaps no ontological significance, but valuable, as concepts, simply for economy of thought. This teaching, if true, puts an end to mechanistic naturalism as so much mythology; and it is little wonder that the natural theologian rejoiced in the relaxation which it effected of that tightening grip of law and matter in which Huxley, before his capitulation to spiritualism,[1] saw the banishment of spirit and spontaneity. So far the theologian may be justified in exploiting the teaching of this school. But in so far as it bears on the meaning of natural law, I would venture to advise the theologian not to be too hasty in accepting what looks like a boon from science. I would make bold to reject the fundamental doctrine that science, in its particular laws, merely 'describes,' and to assert that what science therein does, is not what can with any propriety be called 'description.' In one sense, it is something less; because the law-formula is always selective and inexhaustive, emphasising some aspects of phenomena and deliberately ignoring others that are just as much there, even if negligible for some specific purpose. That is not description, in any proper sense of the word. On the other hand, it is something

[1] It has become almost necessary to explain to readers unacquainted with technical terms of metaphysics that this word has no reference to latter-day superstition.

more than description. Unless it were, it seems to me that science could give no justification of the practical success of its own method; for that certainly presupposes a relatively stable nexus in phenomena, such as the word 'description' simply ignores. 'Description' again, with all deference to Poynting and other experts in science, does not merely consist in saying 'how' things happen, if 'how,' as we are told, means merely 'like what.' It means that; but it seems to me to mean much more also; *viz.*, by issuing out of so and so, and by issuing, after an interval of time, in so and so. The word 'cause' may be abolished, as superfluous, from the vocabulary of descriptionist science; but the concept of continuant cause is none the less involved in scientific thought, however much it may be anathematised as a metaphysical fetish. Causal order, as a net-work of relations between impressional data, enters as much as those data themselves, into the make-up of willy-nilly external reality, reality in the one sense in which the word may be used without begging questions. Otherwise laws would have no validity, science no predictiveness; for anything might succeed anything. But laws do actually obtain, and have for some time obtained, at least through certain tracts of the universe. And this is the element of fact with which natural theology is confronted. Of laws that never shall be broken; nay, of laws that shall continue to be valid to-morrow, we *know* nothing. As to them we only have problematic knowledge, which ultimately is sanguine expectation or hope; but as to a certain reach of the past, we have knowledge, if we have knowledge of anything.

We are now ready for our last preliminary enquiry. What are we to mean by 'Nature,' when we speak of laws of Nature? What are the things which, by their behaviour, have hollowed out our law-channels, and of which laws obtain? I raise this question, not with a view to answering it, but just to bring to light the fact that the word 'Nature' bears more meanings than one, and that therefore we need to walk warily. We are generally told that science predicates conceptual relations and laws of the perceptual world or of percepts; its concepts, such as electrons, are fictions, in the politer sense of that term, such that Nature behaves *as if* it were constituted of them. I

have no quarrel with that view; but I would draw attention to the fact that if the entities of which laws obtain be called percepts, there is a great difference between them, and the *more* purely perceptual or impressional objects of individual experience, science's primary reality. The 'things' of common parlance, and of science at its lowest level, are already sufficiently conceptual or abstract, and therefore non-perceptual, to be common to the many, and to be what is called 'repeatable.' Not to speak of the much more abstract objects of theoretical physics, these commonsense things are carved out of our perceptual continua; and the carving involves a profuse shedding of chippings, which science and philosophy, each for a different reason, disdain to examine. *Natura non nisi dividendo vincitur.* But Nature thus neatly partitioned into isolated systems and clipped to fit theory according to the incidental requirements of our human time-span, and the demands of the particular senses that in man happen to be the most highly developed, is not the same thing as Nature before science or even commonsense vivisected her. Science's Nature is not primary, concrete, complete, reality, or datum; it is rather a skeleton, or a diagram, thereof. It certainly has some sort of correspondence to the original, some sort of validity. Equally certainly it has not the relation of copy to original. Science selects as her 'primary qualities' those which are subservient to number and yield identities, real or supposed, behind phenomenal diversity: she ignores the others, and eliminates them when advancing to theory. There is no harm in that, provided science does not go on to treat what she has left out as if it had never been there: no harm, at least, for her own departmental procedure. But it is conceivable that the aspects of physical phenomena that are the most essential for science's business, are not the most significant 'utterances' of things; and that for other kinds of business with Nature, and in respect of her meaning —which science does not concern itself with—they are the most superficial and insignificant. If this were really so, the truth that the scientific artifact which has received the name of Nature, is largely ordered by number and patient of quantitative law, is not necessarily profoundly important. But, however this may be, it behoves us to recognize, when we talk of

Nature, and natural law, that Nature as a scientific artifact is one thing; that the primary, concrete, largely a-logical actuality or 'Nature' which is really 'there' before our selectively distributed attention has performed its carving or dividing operations, is quite another thing.

I do not wish to go on to insinuate, with certain recent relativists, that Nature's patience of law is but an anthropic reading in, and reveals much about the human mind but nothing about the external world. I would merely remark further that any nomic necessity by which physical science appears to replace contingency, has relevance not necessarily to unclipped experience, but only to the scientific description thereof; and that this certainly does leave out, if it does not read in. I would prefer to try to cope with any such difficulties as the reign of law may present to theology at their maximum, and will therefore assume (though under protest, provisionally, and for the sake of argument) that ordering by number, etc., or law-abidingness, *is* a characteristic of primary reality; and not merely of any semblance thereof that man's subjectivity has fashioned.

In passing now to definitely theological problems, I will presume that at this time it is hardly necessary to reckon with the materialistic atheism which saw in a reign of natural law the proof of the fool's negative, 'there is no God,' or a ground for the assertion that 'as science advances, God retreats.' Even if the physical world were proved to be merely a mechanism and no more, which has certainly not been proved, the mechanism, after analogy with any human machine, might still be a divine means to a divine end. If this were the whole truth, the relation of God to the world would need, indeed, to be construed deistically; but a relation there would still be. Science, however, is not able to affirm that the world is a closed system, or that the only forces in it are impressed physical forces; any more than it is able to affirm the world to be Godless. These are assumptions comparable to the rules of a game, such as chess: restrictions self-imposed for a methodological purpose, adopted by science without metaphysical *parti pris*, and with no intent to treat them as verifiable dogmas. As to the general possibility of control of the motion of material bodies by 'divine energising,' science, with the fact of man's control

f the physical confronting it, can make no demur. The only uestion is whether this alleged divine directivity is or is not ompatible with such law or regularity in Nature as science has ound.

The presuppositions on which I would deal with this ques-on have already been submitted, and reasons have been given r adopting them. I assume, that is to say, that the world nsists of a plurality of substances or continuants, whose de-rminate nature bespeaks determinate relations and inter-ctions; so that there is a nexus of causation, immanent and ranseunt, which is the stable basis of a reign of law. This is ie 'relatively settled order' of Bishop Butler; the 'natural' s contrasted with the 'supernatural,' in the one sense in which iat antithesis possesses any significance; or, as I would pre-er to put it, it is the sphere of delegated activity and of secon-ary causes. And if we may assume so much, as against the antheism that would deny all secondary or delegated causa-ion and would see in divine conservation nothing but re-reation every instant, and contingency everywhere, then we ave before us the supposition that this 'planted out' order f Nature is largely left to work out its potentialities by itself; iat it is not the outcome of a succession of unpredictable, in-omprehensible miracles, or of unmediated and direct, fresh reative acts of God. This supposition does not rule out rovidence or miracle or deny divine immanence. But it does mply that there is a settled order—a delegated activity—a iechanism, if that term may be used without its naturalistic r atheistic associations—over against its Creator and Gover-or. We must speak of God and Nature, not of *Deus sive Natura*; and though all the natural is in some senses super-atural—in origin, for instance, and perhaps in instrumentality nd meaning—yet in another sense we must, as theists and as cientists, retain the distinction between the settled order of econdary causation and any unmediated divine creativity such s used to be called 'interference,' between the natural and the upernatural.

This is what I understand to be the relation of the world f science to the God of religion; of law-abiding things to the Mind or Spirit that made them, inspires them with a perhaps

'increasing' purpose, guides and controls them. And th theological issue, at this point, is whether there is really room so far as science can enable us to see, for both the settled orde with its relative independence, its uniformity, or routine, it apparent or *prima facie* God-forsakenness, on the one hand, an the possibility of divine providence and immanence on th other. Scientific laws obtaining, does divine immanenc (which is only a poetic name for divine activity) involve incom patibility with what we may call established scientific proba bilities? Within limits, which it is perhaps impossible actuall to ascertain, there would seem to be no such incompatibility One way in which physicists of the order of the late Professo Poynting have pictured the possibility in question is by attri buting to the Deity the same kind of action on physical thing as Clerk-Maxwell attributed to his imaginary demon. Go may be conceived as ordering Nature, as bringing about event which would not be brought about by Nature unaided, throug altering the paths of molecules by a force at right-angles t their direction, such as would change neither their mass nor th total energy or momentum of the system involved. Such a de flecting force does no work, yet effects a transformation o energy; and inasmuch as the scientific investigator does no watch molecular movements on a cosmic scale, he would, in th case of such supernatural intervention, see nothing abnormal If we are to object to prayer for divine regulation of the physi cal, it must be on ethical rather than on scientific grounds therefore. I do not wish to make more of this particular wa of scientifically providing for divine modification of Nature' ordinary course. I have only alluded to it in order to indicat that direct divine guidance of the purely physical is not to b banished as a scientific impossibility, or as involving an upsetting of a reign of law of which science can legitimatel speak. A much more important reflection, so far as religion i concerned, is that through the direct contact of the divine min with the human mind, which it is beyond the power of scienc to assert or to deny, and through the normal working of th human mind, so inspired, upon the physical—which, again science cannot gainsay—there is opened out an indefinite scop for modification of Nature's tendency, again involving n

breach of known law, and no stultification of scientific intelligence. We have only to call to mind how volition is determined by attention, and attention by suggestion or other mental rapport beyond the reach of introspection, in order to imagine God's operation on the inmost springs of human conduct, and thereby on the world. There cannot, in the admittedly unfathomed mental life of man, be less than psychology has discovered; there may very well be much more. And through this medium, known and unknown, a large part of God's alleged energising on the physical world may be made conceivable. There is no scientific impediment to the pious supposition that more things may be wrought by prayer than this world dreams of, nor to belief in what are called 'particular providences' and 'personal messages'; though I am prepared to admit that the need here arises for 'trying the spirits,' else we open the flood-gates of superstition and 'enthusiasm.'[2]

So much for the compatibility of confidence in science's reign of law with confidence in religion's assertion of the rule of God. I now turn to our concluding question, whether we can advance from proving mere compatibility, between science and theology, and proceed to argue implication. As to this issue, I would submit that the scientific discovery of law-abidingness or regularity in the world, whatever be its metaphysical interpretation, seems enormously to strengthen the great, cumulative, teleological argument on which theistic faith, whether in the plain man or in the professed philosopher, is ultimately grounded.

Reasoned or reasonable theistic belief, I take it, cannot be proved by appeal to particular facts or departments of fact, whether of prophecy or miracle, mystical experiences, or the spiritual dignity of Christ. The old deists seem to me to have uttered an incontrovertible last word when they insisted that all historically revealed religion logically presupposes natural or rational. But if 'rational' be taken to mean demonstrable and presuppositionless, then, as I have tried to show, there is no

[2] With ethical and religious conditions I have now no concern, but only with scientific possibilities. To point out the limitations of science and of its bearing on theism, incurs, I am aware, the danger of being mistaken for disparagement of science and encouragement of superstition.

such thing as rational theology or rational science. There are, however, such things as reasoned or reasonable theology and science: and at bottom, the two are identical as to intellectual status. For it has been made clear of late years that human reason, which is much more than logical computation if it be the faculty by which truth is discovered, contains an alogical or non-rational element. This fact has been long hushed up as if it were indecent: it now stands nakedly revealed. The principles on which all induction rests, and which are therefore presupposed all through science's rationalization of the world, are expressions not of *a priori* or demonstrable knowledge, but of human hope or faith: the faith that this world has meaning. It is true that 'meaning' means something different for science and theology respectively; but that is not the important point. The important point is that the logicians have done away for ever with the old antithesis between scientific knowledge and religious faith. Science, no less than theology, is the substantiation, pragmatically, of 'things hoped for' and 'unseen.' It may be contended that theistic philosophy is but a higher stage of scientific 'knowledge' and perfectly continuous with it. But, not to wander further from the issue before us, I would observe in conclusion that such regularity as science has discovered in Nature, such a reign of law as science is entitled to assert, is a precondition of there being such a thing as human reason or human science at all. Were there no similarities and repetitions in physical events, there could be no thought or knowledge, no prudence or prescience; no intellectual, no moral status, no cosmos. There could also be, for theism, no possible or partial solution of the problem created by the existence of evil in God's world; whereas the actuality of physical ills and the possibility of moral evil are, at least proximately, explained if they be the logically necessary by-products of an evolutionary cosmos. In the settled order of Nature, therefore—the natural as distinguished from the supernatural—theism sees the first link in that chain of facts which receives reasonable interpretation only in terms of teleology. Theism sees in it, in short, its own intellectual basis, and the precondition of its belief that subservience to man's rational and ethical life is Nature's highest good. It is not indeed merely a mass of repeatable similarities

admitting of intelligent classification and rationalization, that Nature presents to science. More significant by far is its epigenesis, its evolutionary process from lower to higher, its suggestiveness of purpose. If that suggestiveness is to be ignored, the only alternative seems to be to regard the order which the world exhibits as the outcome of chance or ungrounded coincidence. There is nothing so credulous as incredulity; but perhaps nothing would more profoundly shock common-sense than to be asked to see a sufficient explanation of Hamlet in the shuffling by a compositor devoid of intelligence of some founts of type. It is difficult, to say the least, to conceive of a world that is elaborately intelligible and amenable to ethical ends as due to non-intelligent causes. Now the unity of world-purpose or meaning cannot be due to the conspiration of its constituent elements; for in so far as these are not rational and ethical they cannot conspire; nor can it be wholly due to the reading in by the mind of man of what is not there. We may not yet know Nature's own laws; maybe we know only our own tentative approximations to them. Nevertheless, the world is a cosmos, in some sense, else no order could have been extracted from it by human science. Newton did not make it a cosmos out of a chaos when he discovered his laws of motion and gravitation; obviously it was equally a cosmos in the time of Ptolemy. The only alternative left, it seems, is that of theism. And if theism be faith, it is but the development into explicitness of the faith in the world's rationality that is implicit through, and essential to, every stage of science from its first beginning in the primitive credulity of uncivilized humanity. So, I conclude, a reign of law such as we have actually found, and as distinguished from the pseudo-scientific travesties of it with which history has made us familiar, is one of the most, if not the most, significant instance of that cumulative suggestiveness of meaning and purpose which the world, as science conceives it, presents to our reason, and which it is simply unreason to ignore.

THE RELIGIOUS CONSCIOUSNESS IN THE LIGHT OF THE HISTORY OF RELIGION

By C. C. J. Webb, M.A., Professor of the Philosophy of the Christian Religion, Oxford.

I WAS originally invited by the organizers of this Conference to read a paper before you on the Religious Consciousness from the Anthropological Point of View. The title thus suggested might seem to fall in naturally with the general topic of our discussions this year, of the scientific approach to religion. For we are, I think, using 'scientific' here in its popular sense, as referring to the *natural* sciences; the sciences, that is to say, which deal with Nature, as the complex or system of objects which confront the human mind, in distinction from that mind as we know it from within, as that which apprehends the universal and the necessary, which *reasons* and *values*, which distinguishes the true from the false, the real from the apparent, the good from the bad, which lastly is not the object of natural science but that whereof natural science is itself a mode or activity. And if we use 'science' in this sense as equivalent to 'natural science,' Anthropology, the Science of Man, so far as it is concerned with man's mind in distinction from his bodily organism (and no one in his senses would have selected me as an exponent of the science of his bodily organism), is not a natural science. Moreover, misconception is apt to arise from the use of a name for the study of the human mind which by custom associates it with the natural sciences and which indeed is used of a group of studies, whereof the truly natural science, which investigates the peculiarities of shape and structure that characterize the skulls and in general the skeletons of the various races of mankind, is regarded as a department. But this was not the only difficulty which I felt about the word Anthropology in this connection. By custom again the word Anthropology suggests not, as its etymology would imply, the study of human nature wherever found, but the study of what is sometimes called the 'lower culture' of primitive or savage

or barbarous men—not of civilized men, except so far as we can trace among these, as of course we often may, traditions or habits surviving from stages of culture which they have on the whole outgrown. Yet civilized men are at least as much men as are uncivilized; even if we do not agree with the Lady Psyche in Tennyson's *Princess* that

> The highest is the measure of the man,
> And not the Kaffir, Hottentot, Malay,
> . . . . . .
> But Homer, Plato, Verulam.

It would not have been worth while, however, to quarrel with a customary limitation of the word—etymology is never by itself a safe guide to meaning—were it not that the anthropologist's concentration of his attention on the 'lower culture' does tend, I think, to induce certain fallacies which are nowhere more prevalent or more mischievous than in his study of religion. I have especially in my mind the fallacy which sees in higher developments merely survivals of their own lower stages. This fallacy is far more often committed in regard to religion than to other forms of our spiritual activity. What would be said of anyone who should regard the probable evolution of the fiddle bow from the bow used in primitive warfare as a ground for regarding the appreciation and study of music as a mere by-form of instinctive pugnacity? Yet this would not be much, if at all, more absurd than certain so-called 'explanations' of religion which have been put forward by respectable authors. The pedigree of Natural Science itself may be traced along certain lines of its descent to what we should call magic; but are we therefore to regard it as a 'survival' of primitive superstition? and not rather the practice of magic as an immature form of applied science? It is true that if we resist the associations which have gathered about the term Anthropology and attend to the higher religions of mankind no less than to primitive cults and myths and to the echoes thereof in the worship and theology of the great historic faiths, we shall be less prone to fall into this fallacy; but even so we may not escape altogether from its influence, unless we are careful to bear in mind that we must study these not only in respect of their external ceremonial and liturgy but in the devotional life of their convinced adherents and in

their effects upon the thought and action of the civilized world. I remember once, some years ago, meeting at dinner a Japanese gentleman attached to his embassy in London who had represented the Ambassador at the consecration of a bishop for Corea in St. Paul's Cathedral by the present Archbishop of Canterbury, a ceremony which he had been especially interested in attending, because he had heard the Archbishop speak on some important question in the House of Lords and had been much impressed by the weightiness and wisdom of his contribution to the debate. He told me how he had been struck by the similarity of the movements and gestures of the officiating clergy to those which he had seen in Buddhist temples in his own country. 'Then I knew,' said he, 'that religion is ——' and I expected him to say 'very much alike in all countries,' or something to that effect, but what he *did* say was, 'Then I knew that religion was *all nonsense*!' This remark, however, only puts somewhat trenchantly a thought which often suggests itself to those who have occupied themselves with the comparative study of religions. But it is plainly not a thought which is justified by the circumstances which inspired it. Even the reflection which I expected my Japanese friend to make, that religion is much alike everywhere, would really have been superficial. There might be little outward difference in the eyes of an uninitiated spectator between a meeting of the medical section of the British Association and one of some congress of Christian Scientists; but this would not go any way towards proving that their respective discussions were equal in scientific value and importance, and that there was little to choose between them. Still less would it be a sufficient ground for asserting that the discussion of the nature of disease, which might be said to be the topic of both assemblies, was '*all nonsense*'!

The first result of a general survey of the history of religion, including the religion of uncivilized and of civilized peoples alike, may well be to make us in the first place exclaim with Lucretius, *Tantum relligio potuit suadere malorum*, and doubt whether it has not been on the whole a source of suffering and an instigator of actions which we are accustomed to regard as criminal, rather than a humanizing and moralizing influence; and in the second ask ourselves whether it has not always been

associated with, if indeed it does not essentially imply, a view of the world inconsistent with the only one which, with the progress of the natural sciences, we have come to regard as acceptable to our reason.

I will deal first with the second of these two doubts, and will frankly say that there are two ways of looking at religion, one which is often put forward by believers in some particular religion, and another defended by unbelievers in any particular religion, and that if we adopt either of these two views, mutually opposed as they are, yet resting on the same principle, we shall not be able to exorcise this doubt. One of these views of religion finds in one historical faith a revelation of God unmixed with error, in contrast with all others which are mistakes or at least uncertain guesses at the nature of One Who in the true religion has given an account of Himself infallible and indubitable, not to be discussed or criticized but, when once its divine authority has been ascertained, merely to be accepted as it stands. The other view is that lately urged by one of the most influential thinkers of our day, Benedetto Croce, that religion is only an immature form of philosophy, destined eventually to disappear with the advance of culture, and only able to maintain itself in being among men who have emerged into the full light of modern civilization so long as their philosophy has not absorbed and translated into a scientific form the whole content which religion presents in a figurative or mythological guise.

We must, however, I think, surrender the notion of Revelation which I have just described, as being untenable in view of the facts. Nowhere shall we find this pure and infallible truth presented in complete isolation from the historical development of the human mind, to be taken as it is offered, without risk of error or need of critical investigation. Yet this does not mean that the conception of divine revelation itself is to be jettisoned. On the contrary, its range must be extended. It is inconceivable that any knowledge of God can be attained which is *not* revealed; as though we could discover His secrets against, or even without, the will on His part to reveal them. But the revelation is always, to the end, a revelation under the conditions of human nature. Even when God speaks to us by His Son, it is the Son incarnate; if God is to be manifest in man-

hood, manhood must be taken into God. It is a further question, a profound theological question, with which we are not at present concerned, what value, even as a negative or 'regulative' idea, we must assign to the notion of a divine nature transcending that which is thus revealed.

The view which I have set beside this, as I have urged, untenable view of the revelation implied in religion, the view, familiar already in the Middle Ages as that of Averroes, and now maintained by Croce, which takes religion as a mythological adumbration of what is presented by philosophy in a genuinely scientific form, depends upon a principle, which is in fact common to it with that untenable view of revelation just described; the principle that, as Croce has explicitly affirmed, religion is nothing else than knowledge. The acceptance of this principle would, I think we must admit, involve assent to the view of religion which I have associated with the names of Averroes and Croce. But I do not think it can be accepted. Religion does no doubt imply a view of the world as a whole, a *Weltanschauung*, as the Germans say; and hence, among primitive peoples and in individuals who are by disposition or capacity disqualified for speculation, it often discharges the functions which in others is discharged by philosophy or science. It is in fact historically true, as Croce has observed, that philosophy is the daughter of religion, whose adversary she so often afterwards becomes. Moreover, not only is the world view associated with the religions of primitive peoples or of individuals without scientific or philosophical culture inevitably affected by their degrees of knowledge or intellectual capacity, but, like all activities which affect the common life of whole tribes or nations, like law, for instance, or polity, religion is necessarily more conservative than activities carried on by select groups, and thus in the formulas of worship and devotion and in sacred literature there are frequently embalmed beliefs about the universe as a whole or in detail which science and philosophy have outgrown and which can for persons at a more advanced stage of intellectual development possess only a symbolical value.

Religion and philosophy however, differ, in my judgment, not merely as the immature organism differs from the mature,

but in the response which they respectively make to the reality which evokes them in the human soul. The aim of philosophy is just to *know* the ultimate reality; that of religion to establish what we may call personal relations with the ultimate reality—with that which is at the back of everything, however vaguely and unphilosophically conceived. The latter is the *earlier* of the two aims to be pursued; the former only gradually disentangles itself from it, as in science the interest in theory for its own sake is subsequent to and rarer than the practical interest which has first called attention to that which at a later stage men seek to understand without reference to any advantage to be derived from success other than the satisfaction of their desire for knowledge. The analogy which I have just suggested may seem to exalt philosophy as much above religion as geometry is exalted above mensuration, but perhaps this is not a necessary inference from it. We may not hesitate to regard the austere passion of the mathematician for insight into the nature and properties of space and number as of higher dignity than the search for a rule by which to ascertain the limits of our own and our neighbour's properties, and yet we may not be prepared to deny that the satisfaction of the intelligence by itself is something less than the realization of the whole personality as an organ of a Spirit in which we not only in fact live, move, and have our being, but are in our religion conscious of so doing.

The history of religion, however, it may plausibly be said, scarcely warrants us in regarding religion, except in certain of its highest developments, as involving a consciousness of this kind. But is it not, even in its most elementary forms, an expression of man's sense of the mystery in his environment which, on the one hand, confronts him as the 'numinous' of Rudolf Otto's well-known book, *Das Heilige*; strange, alien, uncanny, and yet, just *because* it does not strike him as a mere plain, uninteresting object—as the flower in Wordsworth's poem about Peter Bell, which 'a yellow primrose was to him, and it was nothing more'—but rather as full of a disturbing, even a menacing 'mana' or power, is therefore like himself *alive* and capable of entering into a mutual relation with him, such as we, at a higher level of reflective thought, might describe as personal intercourse? The object of religion is always presented

as *other*, yet not as barely other, but, as I may put it, *responsively other*, and therefore as revealing, however dimly, that ultimate unity—embracing the self and what is other than self—which, at a more advanced stage of culture, we are accustomed to call God. Religion is then never, as Croce says it is, 'nothing but knowledge'; it is a profounder, more intimate kind of experience than the scientific; an experience which finds its expression in worship, and does not admit of exhaustion without remainder by any philosophical apprehension which, in disentangling itself from its original religious context, has left worship, in any natural sense of the word, altogether behind it.

It is never to be forgotten, however, that it is not as a solitary individual that man confronts the mystery which environs him; it is always, and most obviously in the earliest periods of his history or in the most primitive form of his culture as the member of a *group*; and it is in and through his group that he first strives to enter into closer relationship with this mystery; to propitiate it, it may be (for in the beginning his attitude towards it is mainly one of fear, and the Latin poet was not far wrong in his saying that *Primus in orbe deos fecit timor*), to render it harmless or perhaps even friendly and beneficent. Nay, it is in the life of the group itself, transcending and regulating, enlarging and limiting his individual impulses, that the primitive human being feels at closest quarters the impact of the mystery, strange and terrible, yet an intimate part of his own life, or even its foundation, the rock whence it is hewn and upon which it is built.

This last consideration brings out the intimate connection of the religious with the *moral* life of man, that is with his life as bound to his fellows by a system of mutual obligations, positive and negative. So intimate is this connection that religion has often been regarded as a mere appendix or adjunct to morality, sometimes as even only a symbol of morality, much as others have seen in it a symbol of speculative truth. Yet the history of religion—I hope I may be allowed to dwell very briefly on this point, which I have elaborated elsewhere—does not suggest an identification of religion with morality, but rather exhibits them as from the first distinct though never as wholly independent of one another, since from the earliest

times they act and react upon one another. Nor do they always develop *pari passu*. The history of ancient Greece and that of modern India, to mention no others, supply abundant illustrations of practices persisting under the sanction of religion which would elsewhere be regarded as immoral; while we are only too well aware how often the moral standards effectively recognized in Christian societies may lag behind those implied in the recognition of Jesus Christ as divine.

If religion be regarded as having no value except as a means to morality, it will not be easy to exorcise the second of the two doubts which I began by mentioning as induced by a survey of its history. For, although it is indisputable that it has been a powerful agent in promoting conduct which would among ourselves be generally regarded as morally excellent, it cannot be denied that it has frequently promoted conduct which would be not less generally condemned. But, if religion be the appropriate response evoked by a genuine character of reality, crimes wrought in its name no more disprove our right to regard it as an essential feature of our spiritual nature than those of which love has been the instigator would justify us in the hope or the desire to eliminate that passion from human life.

I know of no recent work in which the nature of the religious sentiment as the response evoked in us by something really present in the universe, its distinctness from the moral consciousness, and its essential difference, despite obvious resemblances, from the response elicited by the presence of other human beings, have been better set forth than in Professor Alexander's Gifford Lectures on *Time, Space, and Deity*, notwithstanding his peculiar (and to myself quite unacceptable) conception of its object, God, as something which is always yet to be but never actually *is*. I think, however, that the greater part of what is said of religion in the work which I have mentioned is unaffected by this singular feature of its author's theology; and I am glad to have this opportunity of recommending it to the attention of my hearers. Although to those who know the life of religion from within it will always seem vain to contend that so massive an experience is a mere mirage or illusion, yet so numerous and ingenious are the argu-

ments nowadays brought forward in very various quarters in favour of so regarding it that there is a special value in the clear and unhesitating witness of so sincere, independent and original a thinker as Alexander to its claim to be considered not only as a distinct and normal feature of human life, but as the revelation of an objective reality which is apprehended just in this way and which without this characteristic response in us to its presence would remain unperceived.

The contrast of theories intended to expound the presuppositions and implications of the religious consciousness which represent God as *immanent* with those which represent Him as *transcendent* is familiar to all students of the subject. It is certain that conceptions of God which have been largely affected by scientific and philosophical thought are apt, especially in our day, to emphasize the divine immanence. The whole tendency, alike of the modern investigation of nature and of modern metaphysical speculation, is uncongenial to the recognition of a Being who is the Cause of the world process, but remains himself, as it were, external to it and unaffected by it. On the other hand, where the conception of God is reached rather through morality than through science or philosophy, we find a disposition to criticize or reject a theology of immanence as inconsistent with the maintenance of the divine goodness, which is imperilled if the whole content of the world, good and evil alike, is found in God, or if God is conceived as present in it all; while the attitude of self-abasement and penitence which the sense of sin seems to require appears to imply a separation of man from God more real and complete than such a theology could allow. If, however, we approach this subject from the side of the history of Religion, we shall find both factors or moments in the conception of God indispensable to the comprehension of the religious experience as it has actually existed.

As I have already suggested, we may detect both these moments in that most primitive form of religion which fixes upon things as especially endowed with *mana* or mysterious power on account of something queer or strange—something transcending the ordinary—about them; while this very treatment of them as (in Otto's phrase) 'numinous' is tantamount to regarding them as participating in the life whereof we are con-

scious in ourselves, and as capable of affecting us in a more intimate fashion than a mere common object could do; thus foreshadowing the consciousness of the immanence of God in the human spirit which is found at a higher level of religious development.

Any view of the history of religion which is to give to that history a genuine religious significance and does not treat the religious experience (as of course it often has been and still is treated) as something essentially always and everywhere the same, in relation to which the process which we call its history is merely a record of its appropriation under various alternative symbolic forms by different peoples and individuals, must, I think, in the end come to recognize as the main line of the world's religious development that which centres and culminates in Christianity, in the same sense as that in which we commonly take as the line of philosophical and scientific development which is central for universal civilization that which passes through the philosophers and scientific men of ancient Greece, or as the central political system of the world that which traces its descent from the Roman Empire. To say this, however—as the analogous instances which I have cited will suggest—is by no means the same thing as to say that the contributions which have been or which are to be made to the universal religious synthesis to which we must (if in this way we take the history of religion as integral to the revelation made in the course of it) look forward as the goal of the historical process—that the contributions made to it by the peoples which have come in the past or are yet to come in the future into connection with this main line of the religious evolution of humanity do not truly and really modify its character.

As Christianity is thus historically central among religions, so we find that here more than anywhere else full recognition is accorded to both those moments or factors in the religious experience of divine immanence and divine transcendence. Among the great historic faiths the Indian religions, speaking generally, stress the factor of immanence, while Islam stresses that of transcendence. It is noteworthy that in the last-named religion, the mystic element in the religious consciousness has taken its revenge in the so-called Sufi mysticism of the Persian

Moslems, substituting for the orthodox view of the Prophet Mohammed, as one 'whose sins God hath forgiven first and last,' a doctrine of his person closely modelled on the Logos-doctrine of the Christian Church. The Christian doctrine of the Incarnation is, of course, fundamentally a doctrine of immanence; but the same doctrine, so far as it concentrates the manifestation of God in one historic personality, and in a historic movement essentially bound up with that personality, preserves a sense in the worshipper of his distinctness from the object of his worship at the very point where the union of the divine with the human is realized as accomplished; and also associates the divine revelation with a definite ethical standard, thus avoiding the tendency of Indian religion (a tendency sometimes admitted and regretted by thoughtful Indian theologians) to blur moral distinctions in the interest of the universal immanence of God —a tendency which the worship of Krishna, to whose glorification the sacred book most influential in educated Hindu circles, the *Bhagavadgita*, is devoted, can only, in contrast with the Christian worship of Jesus, sanction and encourage.

I am not contending that Christian theology, although it thus, as I think, recognizes the necessity to religion of both these factors, has solved the problem of their relation. But it has justified the claim of Christianity to be the world's central religion and the nucleus of any synthesis of the world's religious experiences to which we can look forward by its refusal to let go of either: a refusal which has often thrown its weight into the scales at crises in the history of thought, now against doctrines which in the interest of transcendence would eliminate the mystical element from religion, now against others which would merge the individual spirit in the divine; for either kind of doctrine would be fatal to the essential Christian view of God as at once the one sole source of all real being and as manifested in a historical process centering in the person of Jesus Christ and in the movement guided by a Spirit recognizable as his.

On a vast subject I have only—it is all that the time at our disposal admits—indicated lines of thought which, I hope, some may be interested in further working out for themselves.

PSYCHOLOGY AND RELIGION*

By J. A. Hadfield, M.A., M.B., Ch.B., Author of *Psychology and Morals*, etc.

A GENERATION ago there was an immense conflict in the religious world between biology and religion, especi-lly on the question of evolution. Religious people were say-ng that God created every creature after his kind; the theory f evolution said that the species were evolved as the result of nvironmental conditions and the struggle for existence. In nat controversy there were foolish zealots in the religious ause who said: If evolution is true, religion must be false. s it turned out, the theory of evolution, generally speaking, as accepted as true, and these zealots were made to look very oolish in not accepting the conclusions of their own logic. Nobody to-day bothers very much as to the question of reli-ion and evolution, although there are, of course, other biolo-ical problems of tremendous importance to religion. In eneral I suppose the answer to that question is, that evolution as indeed changed our conception of the way in which God orks, without affecting our belief in God. Instead of think-g of God as working from the outside and creating the world s an Artificer, we think of God as working from the inside; at is to say, working through nature.

There is impending at the present time another great con-ct which I think will be a great deal more severe than the nflict of a generation ago—a conflict between religion and sychology—especially that branch of psychology known as e new psychology, which attempts to investigate the hidden otives of human conduct and the hidden sources of human lief. Questions are raised, for instance, as to the ultimate urces of our beliefs in religion and in ethics. The kind of estions raised are these: Whether prayer is anything but to-suggestion; whether God is not merely a projection of a ther-complex; whether religion itself is not an infantile atti-de towards life, a neurosis; whether the belief in an after-life

* An address delivered from notes at the Conference of Modern Church-n on the Scientific Approach to Religion, Oxford, August 29th, 1924.

is not simply a belief encouraged by those who are incapabl of meeting their responsibilities in this life. Many problem of that sort are raised by the new psychology. I shall no attempt to answer nor even raise in detail those questions now because they are very big questions; I shall attempt only t suggest the general lines of what I believe to be the reply t those questions and criticisms. In general, I think the cor clusion will be found to be almost identical with that in th controversy with biology a generation ago; that is to say, th new psychology will very largely change our views of religio and our views about God, but it will not affect our ultimat belief in God and the ultimate need for God. In other words I believe that when we come to face the problems, we shall fin that the new psychology will search very deeply into th fundamentals of religion and distinguish the true from th false in religion, and that out of this searching criticism wil come something that is more firmly established than what w held before. There is no sphere in which that is better illus trated than the question whether prayer is auto-suggestion. shall not deal with the question of prayer now, as it will b dealt with this evening, nor do I wish to suggest that this is th right explanation of prayer; I only want to show the analogy be tween it and the answer to the question about evolution Prayer, it is said, is auto-suggestion. That is to say, when w pray for strength, the strength comes from within ourselves But that does not answer the ultimate question, because th question then arises, where does that strength come from The strength comes through us but does not come from us To say it comes from within ourselves does not point us t the ultimate source of that life and power which is as hidde and mysterious as ever it was. In other words, we shall com round, I believe, to exactly the same conclusion as we did i regard to evolution. To say that prayer is auto-suggestion i merely to refer to the mechanism of the thing; it does not in th least answer the question as to where the power ultimatel comes from. Again, just as in evolution we said that, instea of working from the outside, God works through nature, so w now may say that in prayer, instead of God working from th outside, so to speak, God works through the human soul, an if you like, through the 'sub-conscious' mind.

Before passing on in detail to refer to the other problems and criticisms, we must first clear the ground by saying a word or two about the general question of *the psychological basis of religion*. I believe the psychological basis for religion to be the sense of insufficiency, of need, of incompleteness. It is because we feel insufficient and incomplete that we seek for satisfaction and completeness in religion. Subjectively considered, therefore, the basis of religion is the sense of incompleteness. Objectively considered, religion is that which comes to satisfy that craving for satisfaction and completeness in the human soul. Now this principle, this sense of incompleteness and the corresponding urge to completeness, is characteristic of all living things. Indeed, it is that which largely differentiates non-living matter from living. Non-living things are characterised by the fact that they tend to disintegrate, to break up: whereas living things are characterised by the fact that they build themselves up into a higher unity and a greater completeness. Every organism in the world—it does not matter whether plants, lower animals, or man—is striving to build itself up into the greater completeness and unity: so much so, that they are restless until they are complete. There is a standard of completeness for every individual, whether plant or animal, and every plant or animal has within it an urge to make itself whole again. So strong is this urge, that if there is any break in the completeness in the animal or plant you find this urge compelling it to strive to be complete again. I have elsewhere given illustrations of this principle (in my *Psychology and Morals*). A simple illustration of this is found in a tree. If you break the bark of a tree, what happens to it? It begins to heal over the wound, so that it may be whole again; indeed, the propagation of the finest flowers by gardeners depend largely on this principle; it consists in cutting off the old flowers, and the seed pods; the whole plant then comes to the rescue, so to speak, and builds up a more perfect plant. In the case of a wound of our body, when we cut our hand, for instance, what happens? The whole bodily organism sets to work; the circulation becomes more rapid, the lymphatic system gets busy to kill the bacteria; indeed, the whole organism gets to work until that wound is healed, and the individual is made whole again. Take off the limb of an animal like the newt, and it sets to work

until it grows itself a new limb. This great urge of completeness is one of the most potent and most characteristic things of all organisms.

It is just the same with the human personality. One of the strangest things in the study of psycho-pathology—the study of the diseases of the soul—is that we find that impulses, instinctive impulses, refuse to remain unsatisfied but force themselves into expression in life. The instinct of fear or anger, the sexual instinct, the instinct of curiosity or self-assertion—there is a tremendous urge in them to find fulfilment, satisfaction, completeness. So much is this the case that if you try and repress any of these instinctive tendencies they will not be repressed, but they force themselves out in abnormal ways; and that is the origin of all neurotic conditions. The neurotic symptom simply means that a repressed emotional tendency is striving to find expression, and if you will not allow it normal expression in life, then it will find some kind of abnormal expression. Sometimes it comes out as the emotion itself—for example, in conditions of abnormal fear, of sex perversion, or in conditions of melancholy. At other times, it comes out, not directly as emotion, but by a side door, in the form of neurotic illnesses; if the soldier represses his fear, it may 'come out' as a paralysed leg; if a girl represses her sexual instincts, they may come out as neurasthenia; if we repress our cravings for sympathy overmuch, they come out as hysterical pains; and if, again, we repress our self-assertiveness, it may come out in obsessional compulsions. All those instinctive emotions make demands on our personality. Their impulses are so strong that they refuse to remain unfulfilled, and show a strong urgency to completeness and to fulfilment. Since these neurotic symptoms are the expression of repressed impulses, we are forced to the interesting conclusion that *every neurosis is an attempt of the personality to complete itself*, a conclusion which is borne out by further investigation.

I may remark, in passing, that the way in which those of us who deal with these neurotic conditions treat them is by removing the repressive forces, liberating the repressed emotions, and finding for them an ideal outlet; that is to say, some outlet in which they can all find expression and fulfilment in harmony with one another. That is the function of the ideal.

All that applies to our instincts applies to our personality as a whole. Just as every instinct is striving for expression, so our personality as a whole is striving after completeness and fulfilment. This craving of the whole personality for completeness and for satisfaction is the real psychological basis for religion. As long as the individual is incomplete, as long as the personality as a whole has not found fulfilment, so long it will go on striving and seeking for that ideal whereby it may find fulfilment for all its impulses, and completeness for its whole personality. The progressive attainment of this ideal condition of mind produces happiness.

Religion, objectively considered, is, as I said at the beginning, that which comes to offer men this satisfaction.

From the broadest point of view, of course, any ideal that offers itself and is accepted as a way of finding completeness and happiness, can be called a 'religious' one. We know people who make their golf their religion, which means that they devote themselves to golf, as the one thing in the world that is calculated to satisfy their happiness. Other people make their business into a religion; others, stamp collecting, each regarding this or that as the one thing desired of his soul, and to which he therefore devotes his time and energies. There are others who make uprightness of life into a religion; but this, again, is an incomplete religion, like the others, in that it cannot satisfy the whole of our personality: for if a man seeks merely uprightness of life, there is excluded or repressed from his personality all the aesthetic side of life, and the joyousness of life. Generally speaking, abstract ethical ideals, which are often held up as being the true and only ideals, fail us, for the simple reason that they are not personal: whereas, if our personalities are to find completion, they must find it in a person. The highest religions, therefore, offer us an ideal which is centred in a Person, for the satisfaction of that sense of need and insufficiency which lies at the basis of our religious life.

Indeed, from a psychological point of view, we may take it as a test of a true religion that it is able to give satisfactory fulfilment and outlet to all our instinctive tendencies, to all our energies, and to the functioning of the personality as a whole.

The characteristics of a true religion are, first, that it should find an outlet and expression for all our instinctive tendencies and give completeness to the whole personality, and next, that it should be able to harmonize all these instinctive tendencies by directing them towards a single aim and purpose. From that point of view we may try to find out and test what is the true religion. Quite obviously all religions of fear are insufficient for while they give expression to fear—and fear, as such, is one of the most stimulating and inspiriting of all the instincts—they are insufficient because they do not develop the whole man they do not give expression to those other instincts of love and tenderness which are just as characteristic of man as are those of fear; rather they tend to inhibit him by excess of fear. A fear religion is, therefore, unsatisfactory. I suppose it is because of this that the savages of the South Sea Islands and elsewhere so very readily accepted Christianity when it was offered to them, in spite of its moral demands, because they found that their old religions of fear did not give them that satisfaction and peace of soul which they sought. Or let us take another religion, namely, Buddhism (I am no student of comparative religions, and am stating the purely conventional ideas of these religions, without vouching for their accuracy as descriptive of these religions). Buddhism satisfies one side of our character namely, that of sympathy and tenderness for the suffering of humanity, but it does not satisfy the other side of our character namely, that of self-assertiveness and the idea of power. Buddhism is able to sympathize with the suffering of humanity, but has not the power to lift them out of it, and therefore it does not satisfy our psychological needs. Mohammedanism, on the other hand, encourages the other side; it believes in the will of God, in the idea of power, in self-assertiveness, but does not give expression to those tenderer emotions which are characteristic of the human soul. Therefore, ultimately, it is an excellent religion for the time being for the warrior, but a very poor one for the women, because it does not emphasize that side of life that is more characteristic of women, namely, that of tenderness and love.

So you may go through the religions testing them as to whether they are able to satisfy that need of completeness that lies at the basis of our need of religion. The Christian religion

on the other hand, tends to be much more complete than any of the others. Whether it is the final religion or not I am not prepared to give an opinion, but it does fulfil our needs more because it offers and it satisfies the self-assertive side of man in its campaign in the service of men and in seeking to help humanity. In this same endeavour it satisfies also the tenderer and more sympathetic sides of our nature; so that at any rate Christianity does satisfy those two great sides of our nature, that of power and that of love. From that point of view, the psychological point of view, Christianity is superior to these other religions in satisfying the demands of a true religion. It has proved to many who have sincerely sought to understand its inner meaning to be the living ideal by means of which they have found fulness of life and the greatest happiness.

We are now in a better position to study the problems raised at the beginning of our paper. Take, first of all, the problem as to whether God is not merely a projection of the father-complex. By projection we mean that a mental process is projected and transformed into something objective; we mean that a subjective of experience is converted into an objective reality. When those of us who are doing analytic work investigate the unconscious realms of the minds of neurotic people, we find that one of the chief sources of neurotic disturbance is what is called a father-complex; that is to say, it originates in the fact that as children we had abnormal relations to our fathers. That abnormal relation may be of various kinds. It may be a fear of our fathers; it may be an abnormal authority of our fathers over us in childhood; it may be an abnormal jealousy of our fathers, perhaps, for our mother's love—which appears to be fairly common in childhood. It may, again, be an abnormal affection for our fathers, who may perhaps stimulate sensuous self-gratification in us. In any case, whatever the abnormal condition of childhood is, instead of growing out of that condition as we progress in life, the abnormal relation becomes fixed as an attitude of mind and forms a so-called 'father-complex.' We may try to overcome it by repressing it; we may succeed in forgetting it altogether; we may persuade ourselves that we are very independent and strong and all the rest of it; but these old attitudes, these old relationships with our fathers, tend to persist and affect our

whole life. That is what we mean by a father-complex; that is to say, a morbid relation with our fathers in childhood which still persists as a mental state in the unconscious mind in adult life.

Now a father-complex has two results. The first is that it tends to make people neurotic; because, if you grow up in life with an abnormal fear or sensuous gratification at the back of your mind, you cannot be a properly grown-up person, you cannot face the responsibilities of life properly. The other result is that the old complex, buried in our souls, tends to be projected and formed into an objective reality, namely, that of God: and therefore it is said that our belief in God, our attitude towards God, is simply nothing more nor less than this old buried father-complex that is projecting itself into something that is objective.

I believe myself that this is very largely true. I believe, however, as in the question of evolution, that though there is a great deal of truth in it, that it does not affect our ultimate belief in God nor our ultimate need for God. It is only true so far. The proof that religion may be based on a father-complex is found first of all in this. When people are being analysed for their neurotic conditions, we find that as we get rid of their neurotic condition, we also frequently find that their religion goes too. The reason for that is, of course, that their religion, the religion of these particular people, like their neurosis, is built up based on a father-complex, so that as you get rid of the father-complex you get rid of their religion which was based on their complex. That is a very common experience. But I would only remind you, if you are tempted to charge analysis with robbing people of their faith, that in the first place you are robbing them only of something which in their case is unhealthy and morbid, and is not a real religion at all; and, in the second place, that this changing of the old religion for a new is not different from the normal process which a youth normally goes through at the age of sixteen to eighteen or nineteen. At this age he tends to break away from his early attachments and to slip from the old authorities; and amongst them he throws off his old religion, which of course is unsatisfactory in so far as he has taken it over on authority. He then must needs seek and find a new religion for himself.

That is exactly what takes place in psychology. Many people have their religion built upon a morbid father-complex; when that morbid complex goes their religion goes. But we need not regret that religion going, because it is morbid and savours of a neurotic symptom. This is the first proof that some forms of religion are based on father-complex.

The other is that we actually find that people's views of God are very largely determined by the views about their fathers in early childhood. Our fathers and mothers are in fact our first gods, before we are capable of knowing God. If, therefore, the father was very lenient in early childhood, the son tends to grow up to think of God as a kindly, benevolent old gentleman. If, on the other hand, our father is severe, we tend to think of God as being severe. If our fathers were bad-tempered, then we tend to believe in God as a bad-tempered person, as Jehovah sometimes showed himself to be in the Old Testament. If, on the other hand, our fathers were over-affectionate, we tend to get an erotic tendency towards God and Christ. Again, if the father is tyrannical, the child tends to rebel, and in after life you find him becoming an atheist; that is to say, he rebels against his father, and his rebellion against God takes the form of denying his existence. If our fathers made us terrified by putting moral injunctions upon us, and then frightening us with threats, we tend to have in after life a religion that is over-scrupulous and over-conscientious. A great many people whose lives are largely devoted to carrying out religious ordinances and observances, are simply suffering from neurotic tendencies; their over-conscientiousness is not a thing to be commended, but a thing to be treated.

All this we recognize when we try to be good fathers to our children, because we know perfectly well that their views of God in later life will be based upon their views of ourselves; in these ways, therefore, we find that in actual fact our religion, or a great deal of it, is based upon our father-complex: we make God in an image of our fathers.

But let us not be misled by the discovery of these facts, which undoubtedly point to certain abnormalities in religion. It is quite true that we may make God in the image of our fathers, but this only means that the father-complex affects the way in which we think of God; it does not affect our belief in

the existence of God. It does determine the *form* in which we think of God, but it does not determine our *need* for God. If I may put it in this way, I believe that both our fathers and God are, so to speak, in response to a need. In early life, our ordinary wants and needs were largely supplied by our fathers. But we found our fathers were not sufficient for our deeper needs; they failed us, they proved unsatisfactory, they would not do, and therefore we had to seek for the satisfaction of those needs in something more than even our fathers could offer us. In other words, our fathers were only taken *en route* in the search for completeness and happiness, the need for which goes further back than any knowledge of our fathers. The father-complex is not the origin of our belief in God; it is merely the discredited attempt to satisfy our need. Our fathers may have been our first gods, but behind the belief both in our fathers and our belief in God, there lies this deeper need, a need for completeness and for fulfilment.

The criticism of the new psychology that God is a father-complex is true to the extent that our ideas of God are largely derived from our fathers; it is true also that the religion of a large number of people is morbidly based on a father-complex, but I think we shall come to realize that as an explanation of religion or the need for God, it is inadequate. The need for religion is far deeper; it is something our fathers did not create and were inadequate to supply, and which can be satisfied only when we have discovered a true religion.

Let us take next the criticism—that religion is based on an infantile attitude of mind.

We cannot judge the age of anybody by their years, because there are a very large number of people, twenty, thirty, forty years of age, who in their psychology are perfect children. They have never grown up in life for one reason or another, they are children in their ways, they are infantile in their attitude to life. From one point of view all neurotic people are neurotic because they are infantile and unable to face life. Now it is suggested that religion tends to make people and to keep people infantile in that sense, more especially by the religious doctrine of *trustfulness*. It is said that trust in God means that we are simply kept infantile; no longer having our fathers, we make a father for ourselves, namely God, and we trust in Him

as we trust in our fathers, and thereby remain children. This criticism, too, I believe to be very largely true. I am quite certain a large number of religious people are still infantile in their religious outlook. Their motto is, 'Safety first'—safety both in this life, praying to God for safety and protection day by day, and safety for the life to come. In other words, their religion is just as selfish and self-centred as the child. We see it reflected in our hymns. We sing at the close of the evening service, 'May angels guard us while we sleep, till morning light appears,' with the implication that after that we can look after ourselves. That is to say, our prayer is a prayer for safety, it is the child's prayer, and I have no doubt that an enormous amount of religion is of that type. It is not any disgrace to religion that it gives strength and courage to people who are infantile in that way, but it is a disgrace to religion if it encourages people to *remain* in that infantile attitude of mind. It is no disgrace to our churches any more than to our hospitals that they are full of sick people, but it would be a disgrace if the hospitals or churches were not able to make people well and strong, to put men and women on their feet and enable them to face the responsibilities of life.

This view that religious people are infantile is in fact, therefore, largely true, but it is not the whole truth. Religion itself is not necessarily infantile. There is a religion of the child, and also a religion of the adult—the religion of the child that seeks for safety, and the religion of the adult, which urges him to set out in life to do the work of God, and to take up life's responsibilities, whether it be in the family or in civic or national work, forgetful of himself and careless of his own safety. The religion of the child, corresponding to the psychology of the child, is one that provides for safety. Such a religion is the natural and right one for a child. The religion of the adult is one which corresponds to the psychology of an adult; it seeks to fulfil its responsibilities in life. The child prays for safety, the adult for strength. The religion of the child is self-centred; the religion of the adult is self-forgetful. The religion of the child seeks its own; the religion of the adult seeks to co-operate in working out the will of God.

In such a religion there is nothing infantile, nothing inconsistent with the psychology of a fully-grown man.

At the same time let us not exaggerate the 'manly' element in life; for the superman who crushes the child in him is a potential neurotic. Our wish is not to suppress childhood, but to grow out of childhood.

Every phase in life contains something of permanent value. The healthiest character is that which retains all that is valuable from each phase while it progresses on to the next. There are characteristics of childhood, such as self-centredness, which are typical of childhood and should pass as we attain manhood. There are other traits which are of permanent value which we should retain. Such characteristics are spontaneity, out of which springs genius, perfect frankness, singleness of aim and purpose, joyousness in activity. The man who scorns these and other such tendencies becomes conventional and lacks fertility. If we crush our childhood by an over-temperated 'manliness,' we repress and so lose these characteristics, and are so far incomplete. The man who retains and revels in them will more completely attain the full stature of manhood, and give full expression to his whole personality.

Not least of these characteristics of childhood is that of trustfulness, which we are tempted to scorn as weak, and the religion, which encourages it, as infantile. Real trustfulness does not make for weakness but for strength and self-forgetfulness. We may in fact observe this in the child. Which is actually the bravest child? Is it the child who is prematurely thrust out into the world to be independent, or is it the child who learns to trust his father? The child who is thrust into the world prematurely by a stoical father, who thinks this will 'make a man of him,' nearly always becomes timid and fearful. In other words, a stoic father very commonly has a coward for his son. On the other hand, the child who is brought up by its father to trust in him, so that the child knows that when it is in danger its father will be there, such a child learns to be self-forgetful. It grows up to be trustful and learns in later life not to consider its own safety at all, and so becomes a full-grown man, with the courage to face his responsibilities in life. The really trustful attitude of mind says, 'It does not matter about myself; there is nothing I need fear.' This is the attitude of mind characteristic of an adult faith, and was in fact that encouraged by Christ.

Let us pass to the other criticism, namely, that religion is autoerotic; that is to say, it is based on self-love. Auto-eroticism, or self-love, is another characteristic of the child. In the first phase, its self-love has to do with its own body; the child taking pleasure in bodily gratification and activities. In the next phase it takes pleasure in showing itself off, in its clothes and thinking itself is pretty; later on, in its prowess and activities of various kinds. Now all these are self-love tendencies, and it is suggested that in religion too you get that self-love tendency coming out. This, again, I believe is very largely true in a great deal of religion and in a great many religious people; their religion is founded and based on self-love. I have only to point you to the type of child who at the age of three or four becomes an 'example' or 'model' to other children; he is 'pious,' and likes to think of himself as being superior to them and suggesting a pattern or example to them. You see that attitude of mind in many religious people when they have grown up, or when they are supposed to have grown up, for really they still retain their old infantile self-love. It may take the form of piety, and we come across it in the religious type known as the pietist, and those who devote themselves to the cult of 'holiness.' There is the same tendency there to this auto-eroticism. These people, as a patient recently expressed it to me, are 'hand-in-glove with the Almighty'; they are the special pets of God whose piety entitles them to special favour, they are the favoured of the Deity. All this tendency is, of course, unadulterated self-love; it is auto-erotic, and there is an enormous amount of it in religion. It, of course, is not true religion, not the Christian religion, because if there be one thing the Christian religion teaches, it is love, and love not for oneself but love for others and service for others. Holiness in the true sense means wholeness, and as such may be deemed the end of religious life; but such wholeness or completeness can be attained not by consciously seeking it, but by the fullest expression of love. Religion, therefore, at any rate as expressed in the Christian religion, comes not to encourage the auto-erotic self-love tendency, but comes to encourage the strong and the sympathizing and the loving. Therefore religion is not necessarily based on self-love, although, as a

matter of fact a great deal of it is; and if the new psychology does nothing more than expose this kind of unctious self-love type of religious temperament, it will be doing a very great deal for religion. It is true to say, therefore, that a great deal of religion is merely a manifestation of self-exaltation and self-love. The highest forms of religion, on the other hand, come to deliver man from self-love to a love of man and God.

I want you to observe, at the same time, that this auto-erotic tendency is just as characteristic of irreligion and of atheism, as it is of religion. I am reminded of a patient who did not like to hear anybody speak well of Christ. He did not know why. When we analyzed it out, we found that in early childhood he had the fantasy of himself being Christ, and could not brook any rival. I had another patient, who in early childhood was given such large ideas of his self-importance by his mother and others that when he heard of God he came to think of himself as superseding God whom he regarded as an old gentleman who was really 'past it.' God was going to die like the old phoenix, and he, my patient, 'was going to take the place of the old god with all the latest improvements.' This was in so many words his conception of himself, and therefore he grows up in life and becomes an atheist, his atheism depending entirely on his auto-eroticism, his self-importance. A great many 'infidels' are antagonistic to God because they want to set themselves up as God, their irreligion being simply a manifestation of auto-eroticism. This is as far as our occasion will permit to investigate such criticism of religion.

I have dealt quite cursorily with these various points, because I wished not so much to give you the replies to these problems, but rather to indicate the lines upon which I believe a solution will be found. That general solution is to be found along this line, I believe; that we shall have to admit that a great deal of our modern religion is of a neurotic and perverted type. But I believe we shall still find that, in spite of these criticisms and objections, the need for religion is just as great in the human soul, and will remain just as deep; and also, that there are true religions in the world that are able to offer in greater or less measure the satisfaction of these needs, and of these I believe that there is none greater than our own Christian religion.

CREATIVE PRAYER

By Canon B. H. Streeter, Dean of Queen's College, Oxford.

The Knowledge and Love of God.

PRAYER is an activity in which I frankly confess I am not adept. It is as a theorist rather than a practitioner that I venture to address you to-night. My excuse for doing so is simply this. Theory in this matter is subsidiary to practice; but wrong theory may often in this, as in other human activities, pervert practice, and it may even frighten off at the start some, who, had they a right theory, might attempt to practise. But even to be in possession of a right theory of prayer is something more than I can presume to. What I offer, therefore, is not even a theory of prayer—but rather thoughts preliminary to such a theory.

'Use not vain repetitions, as the heathen do: for they think they shall be heard for their much speaking . . . your heavenly Father knoweth . . . before ye ask.' So said the Master; and I think it was St. Augustine who summed it up in the untranslatable *non multa locutio, sed multa precatio.*

My subject is 'Creative Prayer'; and I may perhaps assume that only in so far as prayer is true prayer is it likely to be a creative force. But, as we have seen, Christ teaches that prayer is an activity unlike most other human activities in that the character of it is determined not at all by its external manifestations, but solely by the attitude of mind of which it is the expression.

It is of that attitude of mind, then, that I would first of all speak.

'Philosophy,' says Plato, 'begins in wonder.' Religion begins in awe—so at least Prof. Otto would have us believe, who defines the essential element in religion as *mysterium, tremendum, fascinans*—which he calls *das numinose.* Philosophy can never entirely outgrow its wonder; but only in so far as wonder passes into comprehension does philosophy fulfil its proper task. So too with religion. It may never outgrow the element of awe; but its upward track is marked by an ever-growing understanding of the mystery—with a consequent sublimation

of awe into love. At least that was what Christ taught, and that is what is meant by the central doctrine of Christianity, 'No man hath known God at any time, the only begotten Son he hath revealed him.' When God was made manifest in man the mystery was unveiled, and the haunting awe of the terrible unknown was turned into adoring appreciation of the sublimity of the ideal life. 'God is Light and in Him is no darkness at all.'

Prof. Otto's book[1] is without doubt an important contribution to both the philosophy and the psychology of religion; and the author himself is fully alive to the importance of transforming, by the introduction of a content both rational and ethical, the primitive irrational impulsion of religion which he calls *das numinose*. But though he himself recognizes the ever-growing importance of the rational and ethical in the higher evolution of religion, it is the other aspect—the *mysterium, tremendum, fascinans* on which he lays most stress. It may be that in Germany this emphasis is needed: in this country, the real danger to religion is, not that it should become too reasonable and too moral, but that it should be choked by a disguised revival of magic and superstition. In Germany, a vindication of the autonomy of the religious instinct may be the one thing needed; in this country, people need to be reminded that the primitive instinct of religion—like those of sex or self-assertion—requires sublimation and careful education. Deep down in all of us there lurks the primitive savage—in bondage to magic and 'daemonic dread.' A belief in *mumbo jumbo* we will scornfully repudiate; but call it *das numinose*—German is a wonderful language—and make it respectable with a few ethical and rational reservations, and the most 'high-browed' of us will acknowledge its allurement.

The popularity of Otto's book in Germany is the more natural in a country whose soul found expression in the music of Wagner, and whose theologians are content with emphasizing that element in the philosophy of Kant which makes the Ultimate, not merely the Unseen, but the Unknowable, and which sees little use for anything approaching the idea of Incarnation. But the fundamental cry of religion must always be, 'Lord, show us the Father, and it sufficeth us.' And to this an answer, that was once upon a time given, is 'Have I been so

[1] Translated as *The Idea of the Holy* (Clarendon Press, 1924).

ng time with you, and dost thou not know *me*, Philip? He at hath seen me hath seen the Father.' He who penned this ad travelled a very long way from the *mysterium*, *tremendum*, *scinans*, conception of religion.

'Thou shalt love the Lord thy God.' But love is slavish nless based upon an intelligent appreciation of the character f the beloved. Some people are for ever disparaging intellect, n the ground that it does not and cannot determine the ends e value, but merely the means by which we may attain them. ranted that is so, only the more does it follow that if the ideal wards which the life of prayer is aiming is fellowship with od, it must try to understand Him, and that in proportion as at understanding becomes more perfect, man will approxiate nearer to that goal. But as he does so, that awe which is s of children in the dark will be left behind; and the abashing ough alluring fascination of mystery, like that evoked by a uccessful ghost story, will be outgrown.

In the Benediction, which often as we hear it, never fails o evoke an answering response, 'the knowledge and love of od' is the thing singled out as the core of all true blessedness. Iy first point, then, this evening is that prayer which is truly hristian starts, not from some *fascinans mysterium*, but from ne knowledge and love of God. And note that knowledge omes first; for, on the Christian hypothesis, if we really know od, we cannot help but love Him.

Self-Knowledge.

And my second point is this: to know God one must first now oneself. *De caelo descendit* γνῶθι σεαυτὸν. Psychologists ell us that we inevitably project ourselves upon the world outide. The motives, the ambitions, the fears, which we suspect n others are largely those which, though we know it not, are resent in our minds. Especially is this so if we are the victims f any deep-rooted internal disharmony—a repressed fear, a idden shame, a buried humiliation. That, it seems to me, is ne justification (on its psychological side) of the emphasis laid y so many religious teachers on the necessity of the sense of orgiveness as the starting-point of the religious life. In human riendships we do not get much further forward where either

of the parties feels that his or her position with the other is *insecure*; and this must always be the case, wherever one feels that, if the other one knew him as he really is, he would deem that friendship unworthily disposed. Unreality is fatal to communion between two human souls; it must, therefore, be fatal to any fellowship of man with God.

In perfect human friendship we know that the other person is fundamentally aware, not necessarily of the whole catalogue of our factual delinquencies, but of those weaknesses in our character which from time to time break out in act; but we also know that, in spite of these weaknesses, we and our friendship are actually valued by the other person. So it must be between man and God. That is why the preachers are right to tell us that we must first repent. But what does this really mean? God is aware of our weaknesses and delinquencies without our telling Him. Unfortunately—and this the preacher rarely recognizes—it is ourselves who are largely unaware of them. The actual offences against a code, or against persons, of which we are acutely aware, are very frequently merely the symptoms, as it were, of defects of character of which we are unaware. Many people, for example, may passionately deplore occasional lapses of temper with some member of their family, without ever guessing that this is an incidental bye-product of a fundamental vanity which that particular person unknowingly wounds. 'O wad some power the giftie gie us . . .'

If we are the victims of some undetected moral weakness—and most of us are—God is already aware of that weakness; but until *we* become aware of it and frankly admit it and candidly face the fact that we are 'that sort of person,' the so-called repentance which we feel and express is not the real thing. Once, however, we have discovered and faced the fact that we are 'that sort of person,' a prospect opens of our becoming something better. Whether it is cowardice we detect, or pretentiousness or silly vanity or sexuality or meanness or any of the other things that we happen personally to regard as most contemptible—and it is a fairly good rule that the qualities we most despise in others are those which we possess, but by thought, word and often by contrary-seeming deeds, hide from ourselves—to have realized and faced up to our own characters is three-quarters of repentance. And

this becomes Christian repentance when we go on to reflect that, poor creatures as we are, God has a use for us, and offer ourselves to God in that belief.

> Just as I am, without one plea
> Save that thy blood was shed for me,
> O Lamb of God, I come.

The sacrificial metaphor of lamb and blood in these familiar lines causes some to miss their point; which is simply this, 'worm as I am, there is no limit to the value set upon me by God.'

Nevertheless, I would demur to that strain in religious teaching which seems to inculcate a grovelling attitude of the soul towards God. Such an attitude may be due to one of three things. (1) The survival of what has been called the 'Sultanic conception' of God, which imagines that His anger may be propitiated by exaggerated protestations of abasement and contrition. (2) It may be the expression of an undetected egoism which unconsciously desires to be Prince of something, even if it be of sinners who repent. (3) Often it is a form of overcompensation for some meanness or weakness, which the person dare not frankly face, but endeavours to make up for by enhanced contrition for those shortcomings which he or she has clearly faced.

Nobody who has really succeeded in analysing the springs of his own conduct is likely to feel particularly proud of himself. Religious teachers frequently spend a great deal of time and eloquence in trying to make people feel their worthlessness, to arouse, as they say, 'a sense of sin.' The effort, to my mind, is misapplied. If it were spent in helping people to really know themselves, the sense of humiliation and disgust which they are trying to evoke would follow automatically. Really to know oneself, is to know oneself to be a 'rotter.' But the essential point of Christianity is the assertion that God has a use for 'rotters'—the moment they recognize themselves as such. That recognition, combined with a clear apprehension of the Divine attitude, *ipso facto* starts a new relation between God and man.

The natural man is a person fundamentally well pleased with himself, though with intervals of annoyance or depression at the fact that, at times, he slips into saying or doing

things not quite worthy of his most noble self. On the other hand, the man who has 'come to himself,' says, 'I am a rotter, but one for whom, oddly enough, God has a use; let Him, then, use me for whatever job He wants; true, using a person like me for doing such and such a job looks rather like trying to carve wood with a blunt chisel, but if God likes to use a blunt chisel that is His business.' And if the chisel takes up that attitude, it commonly finds that God has means by which to sharpen its cutting edge.

And here I get to the main point of my paper. The chisel which cuts well in the service of God is sharing in the creative life of God. 'My Father worketh hitherto and I work,' said the Master; and it is promised that those who achieve the right orientation of the soul towards God shall 'have power to become the sons of God,' that is, they may participate in His creative work. Now it is precisely that orientation of the soul towards God, as a result of which we gradually become His sons, and so participate in His creative work, which is the essence of what I have ventured to call 'Creative Prayer.'

The Stoic formulated the secret of life as *vivendum congruenter Naturae*—live in harmony with Nature. If for 'Natura' one substitutes 'God,' thought of as personal, it follows at once that the life of harmonious conformity with that Power must include, not merely act, but also feeling and thought; that is to say, the right orientation of the soul towards God is a precondition of the life of harmony with Him. Prayer, then, will be creative in proportion as it succeeds in being a right orientation of the soul, that is, of the whole life of thought and feeling, to God. It involves, then—and this is a point I would especially emphasize—a much more intelligent method of attaining self-knowledge than those recommended in devotional manuals, and a large element of reflection on men, things and the actual experience of life. It requires something more like what is technically known as 'meditation,' but interpreting that word in a wider sense than its ordinary use in devotional literature.

And while we practise this, there may be times in which, to quote the famous lines of Matthew Arnold:

> A bolt is shot back somewhere in our breast,
> And a lost pulse of feeling stirs again.
> The eye sinks inward, and the heart lies plain,
> And what we mean, we say, and what we would, we know.

Telepathy or Intercession.

Man, says Aristotle, is a social animal, πολιτικὸν ζῷον; Christ implied the same thing when, of the Ideal Society, He used the political metaphor of a Kingdom, or the domestic metaphor which makes men brothers, children of the same Father. It follows that the right orientation of the soul towards God cannot in the case of a social animal be self-centred. Now it is unnatural not to lay before our Heavenly Father our own hopes and needs, our interests, and our fears. Petitionary prayer is, therefore, the expression of a sound instinct, so long as we regard it, not as a means of extorting something from a grudging Deity, but as the spontaneous expression to our Father of wants that we deeply feel, and that it would be hypocrisy to pretend that we did not. These we submit to God because He is our friend, not because we distrust His goodness or desire to bend His will to ours. It follows, then, that to the same, if not even to a greater, extent we are bound to submit to God the needs of others and our hopes and fears on their behalf. We know that if our own soul's life is developing in the right direction, we shall find that we are actually loving our neighbour as ourselves. Unless, then, we find ourselves desiring to pray for others, in the same sense and in the same way as we pray for ourselves, that surely is a symptom that we are not travelling in the right direction.

But, it is often asked, does intercessary prayer really benefit the persons prayed for? Does it, in fact, come within the title Creative Prayer? Is anything actually effected by it? The question is one of very great difficulty, and I do not profess to have ready any answer which I should care to put forward as a considered philosophy of the subject. All I can do is to outline, for what it may be worth, the hypothesis which at the moment presents itself as plausible to my own mind. Or perhaps instead of 'hypothesis' I should rather say 'imaginative picture,' which seems to me reasonably satisfactory.

That prayer for other people has, as a matter of fact, been followed in point of time by benefit to them, is a conclusion for which there exists a large amount of empirical evidence. But that in these cases *post hoc* is equivalent to *propter hoc* is a matter much more difficult to establish; especially as it is not

difficult to produce negative instances, in the shape of cases where individuals have been prayed for much by well-wishers and no obvious benefit has resulted. Nevertheless, one cannot just ignore the testimony of the saints, using the term 'saint' in that larger sense of uncanonised good people which includes some of whose common sense one has a higher opinion than of that of some among those who have been officially canonised. At any rate, for the purpose of this paper, I will venture to assume that there is evidence that—at any rate in some cases and under some conditions—intercessory prayer has brought benefit to persons on whose behalf it was offered. On that assumption I ask the question: If so, why?

(1) I cannot help thinking that each one of us is a centre of a kind of psychic radio-activity, which may be either baneful or beneficial to others. That such influence operates upon persons in whose presence you actually are for the time being is a matter of every-day experience. There are people whose mere presence in a room promotes cheerfulness; there are others who are a dead-weight of depression; while others have the baleful gift of producing an atmosphere of nervous excitability and tension. Again, the difference between the effect upon an audience of one actor or another playing the same part, or of two different singers singing the same song, is not to be accounted for by superiority in any measurable quality like technique or physical gifts. Quite the most remarkable example of this power of creating atmosphere among persons I have met is Sadhu Sundar Singh—and I cannot dissociate this from the fact that he spends so much of his life in prayer.

(2) There is a good deal of evidence for some kind of communication between one mind and another over a considerable distance of space. The name 'telepathy' is commonly given to this kind of communication—or call it 'influence,' if 'communication' seems too definite a word. Some of my friends, who are skilled psychologists, and are therefore especially qualified to pronounce on the value of the evidence adduced, tell me, I candidly admit, that they do not believe that telepathy has yet been proved to exist. Nevertheless, with all due reference to their better knowledge, I think myself that it *is* proved, for this reason. A good deal of the evidence which is submitted as a proof of the possibility of communication with de-

parted spirits is of such a nature that, as it seems to me, one is forced to choose between one of two hypotheses—either there is communication from spirits of the departed or there is telepathic communication between living minds. Since, then, there is undoubtedly a good deal of evidence for telepathic communication, apart from that produced by spiritualists, this other evidence seems to me to weight the balance in favour of the hypothesis of telepathy. Having, however, said this, I would hasten to add that telepathy is not an explanation, it is merely a convenient name for a phenomenon which has so far eluded scientific analysis. But the name telepathy is as convenient as any other for the phenomenon, so long as we do not allow ourselves to be deluded into supposing that a name is also an explanation.

(3) A question which one constantly hears asked is this: 'Is prayer for others a form of telepathy'? The answer I am inclined to give is, 'No, at any rate, not if by telepathy you mean an attempt to practise upon people at a distance a kind of hypnotism intended to do them good.' Prayer is not persuasion practised at a distance by invisible means. There are those who believe in what is sometimes called 'absent treatment,' and there is a certain amount of evidence that some people can produce effects upon others in this way. Whether the evidence will bear scientific examination I do not know; but assuming it will do so, the process I have described could not, however beneficial, properly be called prayer—any more than giving a hungry person a meal could be called 'praying for them,' though, under certain circumstances, it might be the more Christian thing to do. The essence of prayer is that it is addressed to God; and intercession is prayer which expresses a desire that *He* may do something for the other person, or inspire them to do something for themselves. When I pray to God for someone, I am not regarding God as merely a means of communication between my mind and that of my friend.

If one thinks of prayer as telepathy, it ceases to be prayer (though it might still be quite a good thing); nevertheless, the possibility is not ruled out that the kind of psychic *rapport* between individuals, of which telepathic phenomena are one result, may be a means by which God does effect His good purposes. If God uses the medical skill of a doctor to preserve

a life which otherwise would be lost, if He uses the charitable disposition of a millionaire to save a Greek refugee from starvation, if He uses the persuasiveness of an evangelical preacher to turn a sinner to repentance, there is no reason why He should not use the psychic radio-activity (supposing such a thing exists) of any individual to produce a change of heart in an erring friend, or a new hope which will stimulate the vitality of a sick one.

Plato, when he had exhausted the possibilities of conceptual thinking, had recourse to Myth. In a similar quandary I will—at a most respectful distance—follow his example. In a field of investigation in which no other way seems possible, I will frankly resort to thinking in pictures—and my myth is this. Suppose I pray for my friend John, lying on a sick bed say, in Birmingham, what happens? First of all, if I am praying as a Christian should, I start with the realization that John is far dearer to God than he is to me, and that God knows the exact needs of John in the way I could not do, even if I was standing at his bedside. But suppose I was standing at the bedside, I might, by some small service, by suggesting a cheerful thought, or by the sympathy and encouragement of silent presence, very materially modify the mental attitude, the hope and courage of my friend. By so doing I might turn the scale in the battle which is going on, between the forces of disease on the one side, and the vital principle, backed by the doctor's and nurse's skill, on the other. Is it not possible that an influence coming from me at a distance might have similar results? That, you will say, is mere telepathy : so it is, but, given that the *me* from whom that telepathic influence is flashed is not just my ordinary self, but myself in spiritual communion with the Divine, then the kind of influence flashed will be of an entirely different kind and quality to that which would be exercised if I was merely ' off my own bat ' trying a little bit of long-distance hypnotism on a person of whose state of mind at that actual moment I am necessarily unaware, and whose real needs, whether medical or moral, I might gravely misapprehend, even were I on the spot. Intercessory prayer, it seems to me, should consist, to use an old phrase, of the effort to ' hold ' our friend before God, leaving it to Him to give them the thing they really need, but putting our personality with all its facul-

ties, known or unknown, explained or unexplained, at His service to use them—if haply, on this particular occasion and in this particular case, there may be anything in us which may be so used.

But my myth would be extremely misleading if I allowed myself to think of God as a kind of super-intelligent benevolent 'third party,' wholly external both to me and to him for whom I pray. God is not a 'third party'; in Him all of us 'live and move and have our being.' The exact extent to which the individual soul is a part of the Infinite Spirit, or is separate from it, is a matter on which philosophers have said much, and will say more. But we are, at least, on safe ground, if we say that intercessory prayer is a natural and inevitable expression of the fact that man is a social animal, who as he becomes more religious becomes more social. As he advances in religious application he advances in the love of man as well as in the love of God; and, as he advances in the realization of sonship towards God, he advances in the realization of his brotherhood to man. It follows that both the sonship and the brotherhood must find their expression in that right orientation of the self to the Divine wherein, as we have already seen, consists Creative Power.

But in the matter of prayer, theory is of no value unless it is the gateway to practice; and lest I should seem to ignore this fact I will close with some words of Fenelon:

> 'Accustom yourself gradually to let your mental prayer spread over all your daily external occupations. Speak, act, work quietly, as though you were praying, as indeed you ought to be.
>
> 'Do everything without excitement, simply in the spirit of grace. So soon as you perceive natural activity gliding in, recall yourself quietly into the Presence of God. Hearken to what the leadings of grace prompt, and say and do nothing but what God's Holy Spirit teaches. You will find yourself infinitely more quiet, your words will be fewer and more effectual, and while doing less what you do will be more profitable. It is not a question of a hopeless mental activity, but a question of acquiring a quietude and peace in which you readily advise with your Beloved as to all you have to do.'

THE DEVELOPMENT OF MODERN IDEAS OF THE STRUCTURE OF MATTER

By W. J. R. Calvert, M.A., Science Master at Harrow School, author of *Heat* (1922).

MY object in this paper is to put forward the point of view of the experimental physicist, and to show how essentially different it is from that of the philosopher, by considering the development of a few of our present ideas of the structure of matter. The physicist is concerned with an attempt to find out how the phenomena of the natural world occur and the relation between them. He is not, as a scientific man, concerned with Ultimate Causes; he has enough to do in finding out how things happen. His ultimate and only appeal is to experiment. He finds full scope for his imagination in framing theories to help him in forming a mental picture of the relation of phenomena, but such theories are only useful in so far as they can be tested by experiment. In the words of Sir J. J. Thomson, a theory is a tool, not a creed.

We cannot deal fairly with any problems of modern physics without devoting a few minutes to a consideration of the experimental difficulties which led up to the formulation of the Theories of Relativity. About the middle of the nineteenth century, the system of mechanics, originated by Galileo, Newton and others, may be said to have reached its complete development. In this system there are two fundamental properties associated with matter, inertial mass and gravitational attraction; these two properties are apparently quite distinct from one another. Inertial mass is an expression of the observed property of any object that it resists any attempt to change its speed. If it is at rest, it requires a force to set it moving, and if it is moving it requires a force either to increase or decrease the speed or to alter the direction of its motion; it tends to carry on in the direction in which it is moving. Gravitational attraction finds its most familiar illustration in the fact that objects possess weight; they tend to fall towards the earth.

Now the weight of a body varies at different parts of the earth's surface, while the mass apparently does not; this point is well brought out in practical life by the behaviour of two types of time-measuring instruments, chronometers and pendulum clocks. In the chronometer, the rate is controlled by the movement of a balance wheel actuated by a spring. The wheel oscillates backwards and forwards, and the time of oscillation depends on the stiffness of the spring and the inertial mass of the wheel. If the wheel and spring are compensated for temperature changes (corrections which can be adjusted in a laboratory), it is found that the chronometer goes at the same rate at all places. It can be, and still is, used as a means of determining longitude at sea, and on the basis of such determinations a ship does arrive at the place for which she is making. In a clock the rate is controlled by the oscillation of a pendulum; when the pendulum is swinging the restoring force is the weight of the bob instead of a spring. Now, even though it is corrected for temperature, its time of oscillation is different at different places; a pendulum clock, correct in London, loses more than a minute per day in the neighbourhood of the Equator. If such a clock were used as a means of determining longitude, the most grotesque errors would be made.

The weight of a body, then, depends on its position, but at any one place the weights of all bodies are strictly proportional to their inertial masses. This is shown by the fact that in vacuo all bodies fall with precisely the same acceleration, irrespective of their size or material. These observed facts form the starting point of Newton's Theory of Universal Gravitation. By a magnificent effort of imagination, Newton saw that it might be possible to assign to like causes the forces which cause bodies to fall to the Earth and those which keep the Moon in its orbit round the Earth, and the planets in their orbits round the Sun. Assuming that 'every material particle attracts every other material particle with a force proportional to the product of their masses and inversely proportional to the square of the distance between them,' and using the observed acceleration of freely falling bodies near the Earth, he was able to show that gravitation would supply just the right force to keep the Moon in an orbit where the dimensions and periodic time are those which are actually observed. The theory accounts for the

motions of the heavenly bodies with extraordinary accuracy; predictions based on it turn out to be true, *e.g.* the discovery of Neptune and the predictions of the Nautical Almanac. There are indeed certain slight discrepancies, of which an unexplained shift of forty-three seconds per century in the major axis of the orbit of Mercury is the most notable; for the most part, however, the agreement with observation is amazingly close. It may be added that since the death of Newton, the attraction between material bodies has been directly measured in the laboratory.

Turning now to some of the problems which gave rise to the Theories of Relativity. If a man is standing still on the Earth's surface and a brick travelling at thirty miles an hour collides with him, certain phenomena occur. These can in nowise be distinguished from what occurs if the brick is at rest above the Earth's surface and the man moves at thirty miles an hour and collides with it. The phenomena will be the same if the experiment is carried out on the deck of a moving ship. What matters is the relative velocity of the man and the brick. In dealing with any observed motion we are of course dealing with motion relative to something; the word motion by itself is meaningless unless it is an abbreviation for motion relative to some agreed system. But it was a great source of speculation as to whether there was any such thing as an absolute motion (*i.e.* motion relative to some system which was independent of any observing system, wherever situated) which could be detected. It was clear that the ordinary laws of mechanics could not be used to detect it, although certain problems of rotation, to which reference will be made later, seemed at first sight to hint at such a possibility. On the other hand, the development of electrodynamics and optics did seem to hold out some promise; when the conception arose of the aether as the vehicle of all electromagnetic radiation such as light, it was hoped that this might supply a standard of reference. The latter end of the nineteenth century saw many experiments designed to detect 'motion relative to the aether.' The idea was that if bodies such as the Earth moved through a stationary aether, the apparent velocity of light would depend on the velocity, through the aether, of the observer.

But the famous experiments of Michelson and Morley

showed that there was no difference in the measured velocity of light in directions along and perpendicular to the motion of the Earth round the Sun, or in any other directions, while those of Lodge showed that the aether was not carried along in the neighbourhood of a moving body. All attempts to detect motion relative to the aether failed. Special hypotheses could be devised in each case to account for the failure, but a much more fruitful suggestion was that of Einstein, first in the Special Theory of Relativity (1905) and later in the General Theory (1911).

The starting point is to take the failure of these experiments as of fundamental importance, and as meaning that there is no such thing as an ascertainable frame of reference for absolute motion; all that we can hope to observe is relative motion, and observations relative to one frame of reference are of just the same value as observations relative to another. The problem then is, if there are events taking place at certain positions, and one observer is at rest with respect to these positions, while another with his apparatus is moving at uniform velocity with respect to the first, what is the general relation between the observations of the two observers?

The condition, shown by experiment to be true, that although they are moving with respect to each other (and are aware of the movement), light appears to each of them to have the same velocity, can only be satisfied if the two observers differ not only in their measure of the distance between two positions, but also in their measure of the times of events. Two events which appear simultaneous to one observer will not do so to another unless the events are at the same place; the difference in the time interval assigned will depend on the relative velocity of the observers, and on the positions where the events occur. Thus time and space are not independent. 'Time by itself and space by itself are shadows; only a combination of the two exists in its own right.' These are the words of Minkowski, who introduced the idea of a four dimensional Space—Time continuum in which events take place. The history *e.g.* of the motion of a particle, will be represented by a line, called a world line, in this continuum; but the position and date assigned to any stage in its history depends on the observer. The relation between the observations of different observers

can be worked out on these lines, and is assumed to hold for every kind of event. It involves a departure from the traditional laws of mechanics and in particular shows that the idea of the constancy of inertial mass must be given up; a particle moving with respect to an observer would to him have a greater mass than if it were at rest. This effect, which would only become appreciable at speeds approaching that of light, had been observed and measured by Kaufmann in the case of fast-moving β-particles from radio-active substances.

The Special theory dealt only with a particular kind of relative motion between two observing systems, *i.e.* uniform velocity of translation ('translation' in order to exclude the case when one system rotates with respect to the other). To deal with all kinds of motion is much more difficult. We will first take a problem of rotation which has already been mentioned as presenting a difficulty. Supposing we have a sphere of elastic material and a man observing it. If the sphere is made to rotate about a diameter it will bulge at its equator, owing to the inertial mass of the material. But if, instead of making the sphere rotate, the man runs round it, it will not bulge. This seems to be somewhat different from the case of the man and the brick, where it did not matter whether the brick came to the man or the man rushed at the brick. It may, however, be noticed that the sphere rotates relative not only to the man, but to the Earth and the fixed stars. The key to the problem of rotational and accelerated motion generally, was found by Einstein in the relation between gravitational mass and inertial mass. He started with the idea that these are not two distinct things which happen to be proportional, but are merely different manifestations of the same thing.

An object near the Earth, when allowed to fall freely, falls with an acceleration of about 32 ft. per second per second, and we attribute this to the gravitational field due to the Earth. But the same effect could be got in another way. Suppose we had a region where the gravitational field were absent, and bodies remained at rest or in uniform motion in a straight line according to Newton's law. Let there be a large box with an observer inside it, and let it be pulled in a given direction, which we may call upwards, with an acceleration of 32 ft. per second per second. The man inside the box would then find that if he re-

leased an object it would fall to the floor with an acceleration of 32 ft. per second per second relative to the box; he would also feel a force between the floor of the box and his feet. He would describe these effects as due to a gravitational field, while a man outside would say that they were due to the box having an acceleration of 32 ft. per second per second. On Einstein's view, these two ways of describing the effects are equally right; there is no distinction between them. But if this is so, they must be equally good ways of describing all events; thus a ray of light travelling from a source to an observer in a different gravitational field, could be equally well described in terms of an acceleration of the observer with respect to the source. But in that case there would be an apparent displacement of the direction of the light, as in aberration experiments; there should therefore be a displacement when it passes through a gravitational field. As is well known, this effect was observed in the 1919 Eclipse, for light passing close to the Sun.

This is the basis of Einstein's ideas, but they go a great deal further. Events take place in a four dimensional space-time continuum. If we have two events, the positions and dates assigned to them by an observer will depend on the particular frame of reference he uses. But there will be a certain function of these dates and positions, called the spatio-temporal separation of the events, which will not depend on the frame of reference. We may illustrate this by an analogy. Suppose we are mapping out a flat surface. We can specify the position of each of two points in terms of a pair of co-ordinates which depend on the particular frame of reference we use. The distance between these points can then be expressed in terms of the co-ordinates of each of the points, but although the values of the co-ordinates will depend on the frame of reference, the distance between the points does not; it is a perfectly definite length. But the form of the expression for this distance will have to fulfil a condition, determined by the nature of the surface. For example, if we are making a survey of the Earth's surface, we cannot use plane trigonometry in our triangulation; the three angles of a triangle on the Earth's surface do not add up to 180°, and to get the relation between the sides and angles of a triangle we have to bring in a factor, the radius of the Earth, which is an intrinsic property of the Earth's surface.

Now if we take the case of a particle which for certain systems moves with uniform velocity in a straight line, this means that, if Euclidean geometry holds for the space-time continuum, the spatio-temporal separation of two stages in the history of the particle has what mathematicians call a stationary value, *i.e.* it is a maximum or a minimum. If we find that the particle does not move with uniform velocity in a straight line, we can either suppose that the spatio-temporal separation between two stages of its history no longer has a stationary value, and that the departure is due to gravitational forces acting on the particle, or we can suppose that it is still moving so that the spatio-temporal separation has a stationary value but that, owing to the intrinsic structure of the continuum, the expression for the spatio-temporal separation cannot have the form given by Euclidean geometry, and that the attempt to express it in this way causes a misfit, just as we should get a misfit if we mapped out the surface of the Earth on the assumption that the three angles of a triangle added up to 180°. This is the view of the General Theory of Relativity; the fundamental law of motion is the stationary value of the spatio-temporal separation, and the existence of gravitational fields is taken as an indication of the intrinsic structure of the space-time continuum representing the history of Nature, that it does not accord with Euclidean geometry. On this theory, laws of motion have been worked out which, in most cases, give results indistinguishable by experiment from those of traditional mechanics, but which do account qualitatively and quantitatively for effects which could not be accounted for on the old theory, *e.g.* the bending of light in a gravitational field, and the shift in the orbit of Mercury.

It is not possible here to deal with all the merits of the theory, but the chief point is that it links up a large number of apparently disconnected phenomena, and provides a simplified method of regarding them; furthermore, it is the only theory which can account for certain observed effects. The theory works, and satisfies the only test which the physicist applies, *i.e.* experiment. It is the only theory which deals satisfactorily with the problem of gravitation, a fundamental property of matter; for that reason I have thought it worth while to devote part of my time to a treatment of it, however inadequate.

I pass on now to the development of ideas of the structure of atoms.

The starting point is the discovery of Kathode rays and the work of J. J. Thomson, who showed that they consisted of negatively electrified particles to which the name electron was given. From their deflection in magnetic and electric fields he measured the ratio of the charge to the mass; a separate experiment enabled the charge to be determined and hence the mass to be calculated. This latter experiment was based on C. T. R. Wilson's observation, that when moist ionised gas is subjected to sudden expansion, a cloud forms and drops of water condense on the ions in preference to the uncharged molecules. The total amount of water condensed is calculated from the known degree of expansion; the size of the drops from the rate of fall of the cloud, and hence the number of drops is determined. The total charge is determined by sweeping the ions into an electrometer. The method has been improved by H. A. Wilson, and especially by Milikan, who used a non-volatile oil in place of water, and by using a supporting electric field was able to keep the drops under observation for long periods and determine the charge with great accuracy; in these experiments the electron, although far too small to be seen, makes itself felt in a very real manner.

Now electrons can be obtained from many different kinds of matter, and in many different ways, *e.g.* they are given off from heated metals such as the filament of an ordinary wireless valve; they are liberated when ultra-violet light or *X*-rays fall on various substances, and so on. But in whatever way they are produced they are always the same, having a charge of 4.77×10^{-10} e.s.u. and a mass [at low velocities] of 9×10^{-28} gms. or $\frac{1}{1845}$ of the mass of the hydrogen atom. No charge less than that of the electron has ever been found, so it is regarded as the fundamental unit of electricity; and since electrons, all of the same kind, can be got from all sorts of matter, the idea at once suggests itself that they are a constituent of all atoms. Atoms are, however, electrically neutral, so that there must be also a positive charge equal to the total charge on the electrons in the atom. This theory of the atom was developed by J. J. Thomson.

The mass of the electron being so small, there might be a large number of them in an atom, but Barkla showed, by experiments on the scattering of X-rays, that the number in any atom was somewhere about half the atomic weight. The main part, therefore, of the mass of the atom must be associated with the positive part.

The discovery of radio-activity, and the work of Rutherford and Soddy upon it, threw much light on the problem of the atom. In radio-active transformations, three types of radiation are met with : α-rays which were found to have a positive charge twice that of the electron, and a mass about four times that of the hydrogen atom [Rutherford proved the identity of the α-particle with the helium atom or rather with the positive part of the helium atom]; β-rays which turned out to be the fast moving electrons; and γ-rays which proved to be very penetrating X-rays. The experiments showed that in radio-active processes, elements are definitely transmuted into different elements; a most important result. An equally important consequence of these discoveries was that the α-rays provided a most useful tool to Rutherford and others for investigating the interior of other atoms.

The energy of the fast moving α-particles is so great, that it can produce effects which enable individual particles to be detected. Thus when it falls on certain substances, like zinc sulphide, it produces a flash of scintillation easily observable in a dark room. It can also ionise a gas to such an extent that, under certain conditions, the increase of conduction due to a single particle can be detected. In this way Rutherford was able to count the number of α-particles given off in a certain time by a given amount of radio-active material, and by comparing it with the number of scintillations produced by a similar amount of material, obtain independent evidence that each scintillation correspond with the arrival of a single α-particle. The method of counting scintillations has proved of great service.

Owing to its energy of motion, the α-particle is able to pass through the structure of atoms in its path, and when it meets with a deflecting field in the atom it deviates from its path. The experiments of Geiger and Marsden showed that this scattering is in general small, and increased with the atomic

weight of the material; but even when the material is a thin sheet there are some α-particles scattered in a backwards direction. The number of such particles is much greater than is to be expected from statistical calculations, if the general scattering represents the resultant of a large number of small random deflections; it indicates that occasionally the α-particle encounters such a strong field, that it is turned back as the result of a collision with a single atom. This involves the assumption that the atom must contain a massive charged centre of very minute dimensions. Rutherford therefore formulated his idea of a nucleus atom, *i.e.* as consisting of a minute positively charged nucleus, containing most of the mass of the atom, surrounded at relatively large distances by electrons equal in number to the resultant positive charge on the nucleus (in fundamental units). The dimensions of the nucleus could be estimated from these and other experiments, and so also can the dimensions of electrons. It appears that the atom is a very open structure, the separation between the nucleus and the electrons being greater, in proportion to their size, than the separation between the planets and the Sun.

The scattering of the α-rays also gave a means of estimating the charge on the nucleus; the charge for different elements turned out to be about equal to half the atomic weight, but could not in these experiments be determined with greater precision. It was suggested by van der Broek that the results were not inconsistent with the view that the charge (in fundamental units) was equal to the atomic number of the element, *i.e.* the number which assigns the place of the element in a list arranged in order of increasing atomic weights. This suggestion was used by Bohr in his theory, before its correctness had been established by the experiments of Mosely.

Mosely examined the X-ray spectra of a number of elements and found that what is known as the K-spectrum was very similar for all elements; it consisted mainly of two bright lines, and the frequency corresponding to these lines varied by definite steps from element to element. The frequencies were also in good accord with calculations based on the assumption that the nuclear charge was equal to the atomic number. The discovery of an observable effect which varied by a definite amount from element to element enabled Mosely to assign a

number to any element; all the numbers are represented by known elements, from Hydrogen 1 to Uranium 92, with one or two exceptions, e.g. there is no element corresponding to the number 75. These gaps represent possible, but as yet undiscovered, elements. Improved experiments on the scattering of α-rays, made by Chadwick, have also shown directly that in the case of some of the heavier elements, the nuclear charge is numerically equal to the atomic number, and there is little doubt of the truth of the idea.

From the point of view of the nuclear atom, the chemical properties of an element depend on the number and arrangement of the electrons in an atom, and this again depends on the nuclear charge. It is possible that elements might exist having the same nuclear charge and different mass. It was soon observed that certain radio-active elements, *e.g.* thorium and ionium, showed widely different radio-active properties but were chemically so similar that they could not be separated by chemical methods. Such elements are known as isotopes, since they seem to occupy the same place in the list of elements. This brings us to the study of the nucleus.

The starting point was Sir J. J. Thomson's work on positive ray analysis. When a discharge is passed through a gas at low pressure, there are formed, in addition to kathode rays, certain rays carrying a positive charge. Thomson's measurements of their mass showed that they consisted of positively charged atoms or molecules, *i.e.* atoms or molecules which had lost one or more electrons; he showed how the experiment could be used to determine the weight of such atoms and molecules as were present. The method was greatly improved by Aston in his mass spectrograph, and he showed that when the discharge was passed through (Neon at Wt. 20.2), the positive rays always indicated the presence of two sets of atoms with atomic weights of 20 and 22 respectively. Thus ordinary neon consists of two isotopes having these atomic weights. The experiments were performed with a number of different elements, and it was found that in all cases where the atomic weight was not almost exactly a whole number, there were always two or more isotopes of whole-numbered atomic weights. Many of the elements have not been examined, but there is little doubt of the general truth of the idea that all individual atoms have

whole-numbered atomic weights. Hydrogen with atomic weight 1.008 is an exception, and this has a special significance.

In all experiments the smallest mass ever found associated with a positive charge is that of the hydrogen nucleus, which has a charge numerically equal to that of the electron. This is regarded as the ultimate unit of positive electricity and is called a proton. Since the charge on a nucleus is always a whole-number of times this unit, it suggests that the nucleus is built up of protons. This is further suggested by Aston's whole-number rule for atomic weights. But if this is so there must in all cases, except hydrogen itself, be electrons as well; since the atomic weight is greater than the atomic number. Thus the helium nucleus has a mass about four times the proton and a charge twice as great; this suggests a nucleus of four protons and two electrons. The electrons would help to account for the stability of the nucleus.

On this point there are two sets of experimental results. Chadwick has shown that when certain light elements, notably aluminium, are bombarded by swift α-rays, hydrogen nuclei are produced which can be detected at ranges far beyond that of a free hydrogen nucleus set in motion by a collision. There is no doubt that these hydrogen nuclei are released from the nuclear structure of a complex atom. Radio-active evidence also makes it clear that helium nuclei and electrons are sometimes released from a heavy nucleus. On the whole we may say that all the evidence points to the idea of a nuclear atom, in which the nucleus is built up of protons and electrons and is surrounded at relatively great distances by other electrons; the chemical properties are determined by these outer electrons (or what comes to the same thing, the resultant charge on the nucleus), and the radio-active properties (if any) by the structure of the nucleus.

Finally, we must just mention a most fruitful theory of the atom, due to Niels Bohr. This involves Plancks Quantum Theory, a radical departure from traditional mechanics introduced in 1900 to deal with a problem in radiation where ordinary mechanics breaks down. In the ordinary view of the nuclear atom, if we accept the ordinary laws of electrodynamics, the outer electrons could not be permanently stable but

would fall into the nucleus. Further, the hydrogen atom only contains one electron, and the helium two; the movements of these electrons have to account for the complicated spectra of these elements. On Bohr's theory the electrons are supposed to be in continual revolution about the nucleus, but the revolution can only take place in certain special orbits, defined by a quantum relation. Radiation is given out when, and only when, an electron changes from one orbit to another; the energy acquired by the change of orbit is given off as radiation of frequency n, where the change of energy was hn, h being Plancks constant. The theory has been extraordinarily successful in accounting for experimental results. As an example we may mention that by applying the Relativity correction for the variation in mass of the electron (similar to that applied to the orbit of Mercury) the fine structure of the lines of the hydrogen spectrum was predicted with astonishing accuracy.

In this paper I have tried, however inadequately, to indicate the attitude of mind of the physicist, and his method of trying to learn how the phenomena of Nature occur. He is impressed with the orderliness and beauty of Nature. When he finds that certain things happen in a way he did not expect, he concludes that the laws which he formulated to express how things happen must have been faulty or incomplete; and that it is possible to formulate a law which shall express the facts more accurately. Experience suports him in this view. In this work he does not consider the question of a Creator and His purpose; not because he does not believe in a Creator, but because he feels that he will make more progress in his work by confining himself to observing what happens, and trying to correlate it. He feels that he cannot apply the only sort of test which he recognizes in physics, to the question of the existence and nature of a Creator; no such proof is available, and he must approach that question in a different manner by way of religious experience. I think the best expression of this attitude is given by the words of Tyndall in speaking of perhaps the greatest physicist, Michael Faraday:

> 'He believed the human heart to be swayed by a power to which science or logic opened no approach, and right or wrong, this faith, held in perfect tolerance of the faiths of others, strengthened and beautified his life.'

THE NATURAL AND THE SUPERNATURAL

By the Rev. C. F. Russell, M.A., Headmaster of King Edward's School, Southampton, author of *Religion and Natural Law*.

THE attempt to make Christian faith independent of a belief in the supernatural has been made again and again. It has not succeeded, and I do not think that it will succeed. The better we understand the meaning of the word 'supernatural,' the more strongly, it seems to me, do we become convinced that it describes an element in our religion which is indispensable and of which the value is fundamental.

But you will observe that I say that this conviction of ours as to the importance of the supernatural depends upon our understanding of its meaning; and that is the question, or a part of the question, to the consideration of which this paper has to be devoted. It is very easy, and very common, to attach a meaning to the word which makes it stand for something that is not by any means indispensable to a reasoned Christian belief, and it is this fact which gives colour to the rather frequent statement that liberal Churchmen reject the supernatural altogether. That statement is misleading—I am not quite sure that it is not sometimes intended to be misleading—but at any rate it is true that in the minds of some people the word supernatural stands for something which many of us do quite frankly reject. And this being so, the assertion that liberal Christians believe as strongly in the supernatural, and attach as much importance to it, as any other Christian men and women, true as I imagine it to be, remains a somewhat unprofitable one until we have considered the various ways in which the word is used, and the particular meaning which we, for our part, assign to it.

The title of my paper is 'The Natural and the Supernatural,' and it is clear that the idea of the supernatural involves some kind of relation with that of the natural. This relation is often conceived as simply one of contrast, but I hope to show,

before I have finished, that that is an improper way of conceiving it, and that the mistake of doing so lies at the root of many of our controversies on the subject. As regards the two terms of the relation, one is tempted at first to suppose that while there may be difficulty in defining the meaning of the second, there is no difficulty at all about the first. The 'natural'—how easy and obvious and unmistakable the word sounds. Yet, in point of fact, it is there that our difficulty begins. The varieties of meaning with which the word 'natural' is used are more numerous than in the case of the other; and although some of them are plainly inappropriate to the word in its present connection, I believe that the consideration of them is not a waste of time because, even when we have more or less explicitly discarded them, their effect upon our attitude to the present problem often remains in ways of which we are for the most part quite unconscious.

Let us look, then, at some of the meanings which are given to the word 'natural' in ordinary speech. We may note, first of all, that its significance is frequently no more than 'customary,' 'normal,' 'what might be expected'; and, correspondingly, that 'unnatural' means 'unusual,' 'abnormal,' 'difficult to understand or explain.' You are investigating the mental state of a man whose sanity is doubtful, and someone tells you, 'I saw him yesterday, and he was behaving quite naturally,' which simply means that his behaviour did not strike the observer as in any way unusual when compared with that of the average sane person. Or again, we say of one who completely ignores repeated acts of kindness that his ingratitude is most unnatural, or we may remark that a man does not naturally enjoy the reading of *Punch* when he has just heard of the death of his dearest friend. The same use holds in relation to physical matters; if a man has eleven toes, or a calf has five legs, we are apt to call such deformities unnatural.

I am quite prepared to admit that *in discussing the relation of the natural and the supernatural*, no one is likely to use the word 'natural' in this sense—the sense merely of the 'usual.' Nevertheless, it is a sense which we may rightly take into account, for it seems probable that its common use in other connections helps to strengthen the mental disposition which finds

the supernatural only in abnormal and striking events, and which consequently sees the chief evidence of divine activity in miraculous interferences with the ordinary course of the world's history.

Another way in which the word 'natural' is frequently used arises as an extension or development of the last. We are accustomed to speak of the 'nature' of any particular thing, and to mean by it the special character or sum of qualities which the thing is known to possess, often with particular reference to the purpose which it is apparently intended to serve. Accordingly, we often speak of an event as 'natural' when the different objects concerned in it play parts which we judge to be in harmony with their respective natures. This use differs from the former one chiefly in the fact that the assumption that we know what a thing's true nature is has now become explicit. We now lay claim to the possession of precise knowledge as to how the thing ought to behave, and for what purpose it ought to be employed. This assumption appears to me to be often quite unjustified. If we ourselves make objects for particular purposes, we are entitled to say what those purposes are; but if we find an object already made by a Creator whom we cannot interrogate, then the only ground on which we can base a statement as to the use which may properly be made of the object is that of experiment. The only purposes which we have a right to assume *à priori* that it was not intended for, are those purposes which in fact it cannot accomplish. If experience shows that it can serve several different purposes, A, B and C, we have no business arbitrarily to select among them, and to denounce the use of the thing for the purpose A as 'unnatural' just because we consider that it was intended only for B and C. We may if we like forbid the use for the purpose A on other grounds, but that is a different matter altogether. Let me give you one or two examples of the practice to which I refer—examples, you will probably think, of a somewhat flippant kind. Have you ever heard someone express disapproval, after witnessing the contortions of an acrobat, by saying, 'I am sure the limbs of the human body were not meant to be used like that'? Have you ever heard a nurse rebuke a child for derisively putting out its tongue by saying that tongues were given to talk

with, not to be put out at people? These illustrations, trifling as they are, will at least indicate what I mean; and in the same way I think that a gratuitous and unjustified assumption of knowledge is made when we use 'unnatural' as a descriptive epithet for certain forms of crime, or when a recent writer tells us that 'in Christianity we have the novel idea of the spirit gaining strength by controlling the body, and using it for right and natural purposes.' This kind of thing, surely, is contrary to modern scientific method; for it takes the theory as given, and proceeds to label the facts as natural or unnatural according as they do or do not fit into it. But to the scientist the facts, not the theory, are data; and if a new and well-attested fact contradicts the theory, he does not assign to the fact some uncomplimentary name like 'unnatural,' but he decides that the theory needs to be revised.

It is, I think, through a confusion of this kind, based on a similar illegitimate assumption, that it has sometimes been concluded that if certain psychical powers, say powers of healing, which have been attributed to particular persons, were actually historical, they must have been supernatural. It would seem, however, more correct to say that if they were historical, then the *natural* endowment of man is more rich and diversified than had been imagined before those powers were recognized.

Perhaps the most common use of the word 'natural,' when it is used with some precision, is to characterize an event which takes place, or a condition which exists, apart from the agency of man. In this sense we contrast a natural with a violent death, the natural state of animals with their state under domestication, the beauty of natural scenery with that of a cultivated garden, the method of natural selection in biological evolution with that of rational or artificial selection. This use has some features in common with that one which simply makes natural the equivalent of physical, so that the natural sciences are the physical sciences and natural action means physical action. Both this and the last method of employing the word aim at a much greater precision of reference than that which is attained by those uses of common speech which we noticed first, and for that reason they might be made the ground of the distinction between the natural and the supernatural. But if the meaning

of the word 'natural' is to be restricted in either of these ways, then the supernatural must include in the one case all that part of experience which depends on conscious and intelligent human activity, or in the other everything which transcends the merely physical. Either way, there seems to be nothing for us to argue about to-day, for every view of life admits the existence of that element which we call conscious and intelligent activity, and it is only the materialist who believes that this element can be *fully* described in physical terms. We shall hardly be content with a defence of the supernatural which, in order to preserve it, empties it of all its distinctively religious significance; and certainly the critics of liberal Christianity who assert that Modern Churchmen deny the supernatural would not be likely to alter their opinion merely because we retained it in this emasculated sense. If we are to make good our claim to believe in the supernatural, it must be on other lines than these.

I think it may seem to some of you that hitherto I have been wandering rather aimlessly in this paper. But I want you now to observe that from this brief survey of some of the ways in which the word 'natural' is used, we seem to arrive at a conclusion of considerable importance. All these restricted uses of the word appear to be determined by the desire to confine the natural to a range of phenomena in which the action of law is more or less intelligible and familiar. According to our mood and point of view at the moment, we find ourselves paying special attention to particular uniformities of experience selected from among all those uniformities which we sum up under laws; and consequently certain classes of events fall outside the sphere within which those uniformities to which we are specially attending provide a sufficient descriptive apparatus. We are thinking of some particular class of laws, and the event A has a complexity which prevents its being adequately described by reference to them alone. In that view, which is a definitely limited one, the event A is lawless, in contrast with other events B, C, D which these laws are capable of describing. Therefore we call B, C, D natural happenings, and we think of A as from that point of view unnatural, or supernatural. That, I believe you will find, is the key to the variety of uses of the word 'natural' in the present day. When we say that it is not natural

for a man in the first anguish of sorrow to enjoy the reading of *Punch*, when we call abnormal powers of healing more than natural, when we distinguish between natural and rational selection in evolution, when—with Professor Hobson in his recent Gifford Lectures—we restrict the name natural sciences to those which deal with physical phenomena, we are, whether consciously or not, making a selection—a different one each time—among the laws which our experience has taught us to recognize, and basing our use of the word upon it—a selection which not only is quite legitimate but may be exceedingly useful if it is done deliberately for a specified purpose. The modern use of the word 'natural,' then, is to characterize any part of our experience which exhibits only those regularities and uniformities in the sequence of phenomena of the kind that we try to summarize in descriptive laws; and the term 'supernatural' is presumably left to be applied to some or all of the phenomena which cannot be regarded in this way.

I do not think we need try to improve on this signification of the word 'natural' at which we have arrived; but we are now face to face with our problem. For it is characteristic of modern scientific method to postulate uniformity and regularity everywhere, even in religious experience, and thus the supernatural in the sense of the 'lawless' seems to be driven out of life. So long as some part of our experience was conceived to be outside the realm of law, the contrast between the natural and the supernatural, as the names of mutually exclusive classes, could be maintained: some happenings were natural and others were supernatural. Further, so long as this was accepted as the right and necessary way of understanding them, we can easily see that the gradual enlargement of the realm of law would be disliked as diminishing the scope of divine activity, and when the enlargement could no longer be resisted, many religious people would cling all the more tenaciously to the notion of miraculous interferences in order to preserve for God some small share in the direction of the world's affairs. But now, not only is it considered that all physical action is in accordance with law (even if it be admitted that the particular laws have not yet all been discovered or successfully formulated), but the claim is made that mental phenomena equally exhibit uniformities of sequence,

albeit the laws descriptive of those uniformities involve a different notation and cannot be expressed in terms which admit of merely quantitative measurement. Even where uniformity has not yet been observed, its existence is postulated as the necessary condition of scientific investigation.

[1]At this point, at which I have assumed the uniformity of Nature, I ought perhaps to turn aside for a moment and make some reference to the paper by Dr. Tennant to which we listened on Wednesday evening. Dr. Tennant was at pains to impress upon us that the belief in uniformity was one which could not be justified on purely logical grounds. It was a matter —I think I am accurately quoting his words—of sanguine expectation and hope, but not of logical certainty. To this statement of Dr. Tennant's, taken as I have no doubt it was intended to be, in its literal and strict sense, I imagine that no one could possibly demur. If it be a weakness that our conviction as to the uniformity of Nature is faith rather than knowledge, then the weakness must be admitted. But when we have made the admission which Dr. Tennant required of us, it seems to me to be only fair that we should go on to observe that we are in exactly the same position with regard to our conviction as to even the continued existence of Nature itself. If it be true that we cannot justify by a purely logical process our conviction that the sun will rise to-morrow morning, it is equally true that neither can we justify by a purely logical process our conviction that there will be such a thing as the sun to-morrow at all. I venture to think that Dr. Tennant's paper was misleading, not because I dissent from the statement to which I have referred, but because the paper seemed to me to leave the impression that our belief in the uniformity of Nature was in a peculiar position in this regard, as compared with those other fundamental beliefs upon the basis of which the whole texture of our life is woven. This belief of the scientist, which cannot be proved true by logic, is justified in exactly the same way as those others are justified—by being found to work. Its verification lies not in

[1] The following three paragraphs were added during the Conference to the paper as first written. In view of Dr. Tennant's contention that we had, and could have, no logical proof of the uniformity of nature, it seemed desirable to point out in what way our belief in that uniformity was justified—a belief which the argument of the present paper assumed.

antecedent logic, but in subsequent experience. Thus the faith in natural law is the acceptance of a hypothesis which is continually verifiable in experience and is continually verified. The scientist is no blind devotee of his own laws—laws in the plural; he is ready to scrap them as soon as they cease to serve his needs, and replace them by better ones; but in law—law in the singular—his faith is fixed, and if it were not so there would be an end to the possibility of science altogether.

It is important to observe, further, that it is not quite a complete account of the matter to say merely that at any one time we find uniformity to have held good in the past, and therefore we expect it to continue to do so in the future. We must add that as we look back into the past, we find, beside the evidence of uniformity, a continual succession of points of time when, because of the observed uniformity up to date, we made the venture of expecting it to continue, and were justified in that future which has now become past; so that our data at the present time include the knowledge that the venture which we now once more propose to make has already been made again and again without disaster.

I hesitate to put much weight upon an argument of the 'what-we-might-expect-God-to-do' type; nevertheless, it seems to me that, in the light of our experience of past uniformity, to insist on the necessity of leaving room for direct divine interventions into the order of Nature amounts to saying that the divine wisdom which is expressed in that order was not capable of providing for all emergencies, and is sometimes—to use an everyday phrase—taken by surprise. To me, at least, the conception of a God who needs so to intervene is less lofty and worship-inspiring than that of One who knows His own mind from all eternity, and whose method in Nature is, like Himself, 'the same yesterday, to-day, and for ever.'

If some degree of human freedom is admitted, that undoubtedly introduces a disturbing factor; but it is not an element which by itself constitutes a 'supernatural' of the kind that religion seems to me to require. I do not imagine that it is my business on this occasion to talk about the problem of free-will, and certainly I do not consider that I need stand in a white sheet merely because, like all other libertarians, I am obliged

to leave the difficulties of that problem unresolved. I will only say in that connection that, while I believe in the existence of free-will and shall probably assume it here and there in the remainder of this paper, I do not put it forward as supplying by itself an adequate meaning for a religious belief in the supernatural.

I find myself, therefore, applying the word 'natural' to the whole of my experience, and the resulting conception of 'Nature' is as all-inclusive as that which is expressed by Shakespeare in some lines of the *Winter's Tale* (Act IV, Scene 2). Do you remember the passage? Perdita has stated her preference for natural flowers over those which are produced by artificial culture and breeding; in the case of the latter, she says:

> 'There is an art which, in their piedness, shares
> With great creating nature.'
>
> 'Say, there be;'

replies Polixenes:

> 'Yet nature is made better by no mean,
> But nature makes that mean: so even that art
> Which, you say, adds to nature, is an art
> That nature makes. You see, sweet maid, we marry
> A gentler scion to the wildest stock;
> . . . . . This is an art
> Which does mend nature, change it rather; but
> The art itself is nature.'

If, then, we are driven to the conclusion that any view is doomed which makes the natural and the supernatural refer to mutually exclusive classes of phenomena, what is left for us? We must insist, surely, that to every phenomenon both terms are applicable, and that they refer to different aspects under which the phenomenon can be regarded. The ideas are complementary, not exclusive. In this case, as in so many others, our trouble has arisen through our taking two aspects of life which are separable for thought, and treating them as if they were separable in other respects as well and could exist independently of each other. It is as though some observer were to note the concavity of a surface, and another observer, looking at it from a different position, were to note its convexity, and then we who received accounts of their observations were to conclude that concavity and convexity were the properties of

different surfaces and were to attempt the classification of surfaces under the two heads of (*a*) those which were concave without also being convex, and (*b*) those which were convex without also being concave. So in the present case, we have received reports, as it were, from scientific investigators who have told us that the phenomena with which they deal are natural, and we have also received reports from men of religious insight who have assured us that the matters with which they are concerned are supernatural; and we have proceeded to the assumption that the two sets of teachers must have been dealing with mutually exclusive groups of phenomena, and we have set up a classification of events based on the supposed distinction between those which are natural without being supernatural and those which are supernatural without being natural.

What are the primary interests, respectively, of the scientific and the religious points of view? The scientist is concerned with the 'explanation' of a phenomenon in the sense of discovering the general laws in accordance with which it can be described; and the religious teacher is concerned with the understanding of it in relation to the ultimate purpose of God. The former calls the event natural to imply the success of his attempt to relate it to the idea of law; and the latter calls it supernatural to imply the success of his attempt to relate it to the idea of divine purpose. What is there inconsistent between the two ideas, as now understood? It is true, of course, that in the past they have often been regarded as irreconcilable. The scientist of a former generation sometimes made the presumptuous claim that because an event could be described in terms of law it was necessarily of no religious significance in relation to divine purpose; and so also the religious teacher sometimes made the equally presumptuous claim that the purpose of God could not be brought to accomplishment through the operation of law: we know what sort of things were trumpeted forth on both sides after the publication of *The Origin of Species* in 1859. But, on both sides—may we not say it?—we have learned better now. The scientist, *quâ* scientist, no longer denies the possibility of a divine purpose in Nature, and there are at least some teachers of religion to-day who do not regard the regularity of natural law as inconsistent with the dignity of the God-

head. The two groups of inquirers are beginning to find that, like the observers of concavity and convexity, they are, from different points of view, both looking at the same phenomena all the time. They are discovering that their separate investigations are in fact complementary. They are prepared to believe that everything is natural, and that at the same time everything is supernatural.

It can scarcely be necessary for me to remind you that, apart altogether from the question which we are considering this morning, we are thoroughly familiar with the procedure by which, in considering any phenomenon, we shift from one point of view to another according to the interest which is uppermost in our minds. The same event may be regarded as constituting at one time a problem for mechanics, at another a problem for chemistry, at another a problem for psychology, at another again a problem for ethics. We come almost inevitably to arrange the different sciences which we employ as instruments of investigation in a definite order, according to the complexity of the data with which they deal: first, the most abstract sciences like the mathematical and the physical, then the chemical, and so on through the series of the biological, the psychological, the ethical, the religious. In the fact of my walking upstairs to bed, you have at once a problem for mechanics, a problem for physiology, a problem for psychology, and a problem for morals. If a dog runs to his master on being called, you may discuss the movement of his bones and muscles, or the working of his canine intelligence, or the purpose of his human owner. If a man offers you his newspaper, you may consider the position of his arm as an example of the cantilever, or as a sign of his friendliness. Of the visitors to the Exhibition at Wembley, one man sees in it a triumph of building construction, another a big operation in finance, to a third it is linked up with the political problem of the future of the British Empire. I ask you merely to go one big step further, and to agree with me that in the case of every one of these things we may seek also—though we may not always succeed—to understand its relation to the whole purpose of God.

Perhaps one further example of a different kind will be of use—an example which, partly because it is so familiar, is likely

to bring out my meaning more clearly. What is the outstanding difference between the books of Kings and the work of a modern historian? Is it not simply this—that one is the product of what we call scientific method and the other is the work of religious insight? The difference does not consist—as used to be crudely supposed—in any difference in the degrees of naturalness in the events recorded, but in the point of view from which they are observed. The one writer tries to exhibit his facts so that they may be intelligible in relation to the recognized laws of psychology or economics or climatic influence; the other tries, whether successfully or not, to view the history in the light of divine purpose. To the one his subject matter is natural, to the other it is supernatural. Yet the difference is not to be found in the subject-matter, but in the mental attitude which the writer adopts towards it.

I do not think there is any fragment of our experience, however small, which cannot be used to help towards the understanding of the divine nature and purposes. But I have said enough in the way of elucidation, and I can safely leave you to work out further applications of the theory for yourselves.

Some men are not interested in this background of all experience, others are not willing to take the trouble that is necessary to clear their vision; to such people the world does not present itself as supernatural at all, and they may even go so far as to deny that it can be so regarded. But their failure to discover the supernatural is not due to the clearness of their recognition of natural law; it is due to their lack of the sense of God. To others, the whole of life is a revelation, and everything is supernatural, while at the same time it is material for the most rigid scientific investigation.

The subject on which I have addressed you is a vitally important one, and I feel that I am only groping my way towards a solution. I can offer you nothing cut-and-dried, or that is free from difficulty. But I am sure that the old solution will no serve us any longer, and I believe that the alternative which I have put before you is at least on the right lines.

THE MIRACULOUS

By the Rev. J. C. Hardwick, M.A., B.Sc., author of *Religion and Science from Galileo to Bergson.*

'A MIRACLE,' says the Archbishop in *Saint Joan*, 'is an event which creates faith. That is the purpose and nature of miracles. They may seem very wonderful to the people who witness them, and very simple to those who perform them. That does not matter: if they confirm or create faith, they are true miracles.'

Perhaps we may be pardoned for doubting if this correctly represents the view of a fifteenth century prelate, at least if he were familiar with the works of St. Thomas Aquinas, who (as we shall see later) took a different, and a more sophisticated, view. But it does represent, very exactly, the attitude of the New Testament writers, for whom a miracle is an exceptional event which attracted attention to the personality of a great man, which helped to authenticate his message, to give authority to his words, and create reverence for his person. A miracle for them is 'an event which creates faith,' and probably it is historically true that the New Testament miracles seemed simple enough to those who performed them (so much so in the case of the Synoptic Jesus that He thought them not worth mentioning), while for those who saw them they were clear evidence of the power of God, or (in certain cases) of Beelzebub, working in the performer.

To hold that the New Testament writers regarded 'miracles' in the way we regard them, as breaches of natural law, is to be guilty of an anachronism, and to misunderstand their attitude entirely. Phenomena cannot be attributed to the breach of a law, the existence of which is not realized. Those ideas of natural law, and of the uniformity of Nature, which are so familiar to us, and which were not entirely strange to some of the bolder Greek thinkers anterior to the New Testament writers, were totally foreign to the New Testament writers themselves. To these writers, phenomena presented themselves either as familiar, or as unfamiliar, events. Familiar events

seemed to them to call for no explanation—whereas the moder view is that these are just the events that most need to be ex plained, because the understanding of the familiar gives the ke to the understanding of the unfamiliar. As for unfamilia events, these were not regarded by them as similar in kind t familiar events and explicable in the same terms (which is ou way of regarding them). They were, on the contrary, attribute to the operation of special agencies—to spirits, good or bad or to human beings who happened to be in particularly clos touch with, or to have some hold over, those spirits. At botto they were inexplicable. It is true that familiar events were in explicable too, but only in the sense that no sane person woul ever think of asking to have them explained. The desire t explain the familiar is an entirely artificial and modern pheno menon, introduced by people like Galileo or Newton, who coul not see a pendulum swing or an apple fall without asking ques tions.

It would be an interesting inquiry, but one which there i no time to follow out here, to search for some connection be tween the growth of a belief in natural law, and a decline in th occurrence of miracle. So long as the uniformity of nature i unrecognized, miracles tend to occur; but when that uniformit is recognized, miracles tend to become rare. Miracles were no brought to an end with the New Testament period, as Gibbo pointed out, and as any mediaeval historian would tell us, an as the Roman Church to-day holds. They continued as lon as the mentality which produced them prevailed.

The first notable change in this unsophisticated view whic persisted for so long, may be discovered in the writings of St Thomas Aquinas. He was faced with a system of ideas whic would seem familiar enough to us to-day, but which to th New Testament writers would have seemed entirely foreign He was confronted with a systematized view of Nature, in spired to a large extent by the now familiar notion of natura law, or the Uniformity of Nature. We refer to the Graeco Arabian naturalism which had been introduced into Weste Europe by the Mohammedan commentators upon Aristotle. A fascinating description of the effects of this system of though upon the intellectual life of Europe in the thirteenth centur

vill be found in the late Dr. Rashdall's work on the Mediaeval Universities.

The presence of this system of scientific naturalism on his horizon, introduces a wide gulf between the attitude of St. Thomas and that of the New Testament writers. To him the notion of natural law was familiar, to them it was foreign.

It follows that the Thomist view of miracle is distinct, and should be kept distinct, from the New Testament view. For the New Testament writers a miracle was an unfamiliar event to be attributed to angel, spirit, demon, or divine being. It was no 'breach' of any law, for the good reason that there were no laws to break. The essence of a miracle lay in its unfamiliarity or portentousness. It was intended to attract people's attention to, and to give them a respect for, a personality, or a teaching, or a 'revelation.'

By St. Thomas, on the contrary, the essence of miracle was not placed in its abnormality, but in its being *contrary to, or outside of, the order of Nature.* His definition is explicit: *'Aliquid dicitur esse miraculum, quod fit praeter ordinem totius naturae creatae'* (*Summa Theologica* I, 1, cx. 4). The new conception of the order of Nature which St. Thomas derived from his Arabian contemporaries, made all the difference to his theory of miracle. Here, as elsewhere in his system, he confronted the idea of the Natural with the idea of the Supernatural. So that as there is Natural virtue and Supernatural virtue, Natural knowledge and Supernatural knowledge (Revelation), so there are Natural events and Supernatural events or Miracles.

The theology of St. Thomas Aquinas, including his definition of 'miracle,' is to-day authoritative for Catholic orthodoxy; but (it is important to recognize this) it is *not* the view of the New Testament, which knew nothing of Natural Law.

The contrast between the New Testament and St. Thomas indeed is far greater than that beween St. Thomas and ourselves. Yet between St. Thomas and the man of science to-day there is an important difference. The natural sciences—from physics to psychology—cannot admit his concept of the supernatural.

It is not that the man of science to-day (as is so often represented to be the case) is obsessed with *a priori* notions about

the uniformity of Nature, the impossibility of the supernatural and so forth. The man of science confines himself to describing the behaviour of objects, and does not prescribe modes of behaviour for them. Their behaviour does, as a matter of experience, present a large measure of sameness or uniformity. Things do tend to behave in a regular and calculable fashion, so that some such notion as the uniformity or regularity of Nature becomes a legitimate deduction from experience; but it is in no sense an *a priori* dogma. The only *a priori* dogma held by the man of science to-day is that there are no *a priori* dogmas.

The fact is that men of science reject the concept of the supernatural not because it contradicts their dogmas, but because it stultifies their methods. It seems to them to introduce into the problems they study an incalculable factor which renders abortive all the tested and reliable methods of research.

If this disturbing factor be introduced, the student of natural processes can no longer count upon like causes contributing twice in succession to like results. Nor can he enjoy any confidence that the causes to which he attributes the behaviour of objects are the true causes. Thus the miraculous or the supernatural is equivalent, for the man of science, to an incalculable factor which renders accurate and systematic investigations impossible.

It may be urged that for practical purposes the conflict may be ignored, for tangible interpositions of the miraculous are not held to take place frequently at present—except by the most logical of the Churches, the Roman Catholic. Nevertheless it is clear that a conflict becomes more or less inevitable in the case of one science, the science of History, for History deals with those past events which are regarded as definitely miraculous in character in the sense that they were caused (as St Thomas would put it) *praeter ordinem totius Naturae creatae*. And History deals with these events by explaining them, not in terms of the 'supernatural,' but in terms of our present experience, whether normal or abnormal. Scientific historical research can only apply the methods recognized by all the other natural sciences—the same methods of testing evidence, comparing data, supplying hypotheses, and so forth.

The foregoing considerations have been necessary if we are

to understand the problem of the Miraculous as it presents itself to-day.

The difficulty of the problem, and its remarkable confusion, proceeds from the fact that the orthodox view of miracle, which I equate with St. Thomas' view, is based on a rigid dualism unfamiliar to the New Testament writers and repugnant not only to modern men of science, but also to modern philosophers.

The present writer is of the opinion that the dualism between Natural and Supernatural, which we owe to St. Thomas, ought now to be abandoned as being unscriptural or (what amounts to the same thing) unhistorical, besides being unscientific.

Not that we should return to the nineteenth century notion (if ever it *was* held then) that all Nature is upon one level. We should be prepared to acknowledge the presence in Nature of various levels of existence—in fine, we would substitute for the dualism of St. Thomas what may seem to be a pluralism of our own.

For although the man of science recognizes uniformity as being everywhere, because everywhere it seems to force itself upon his attention, it is not always quite the same kind of uniformity that he sees. And although behaviour is invariably uniform, different levels of behaviour seem to exist. For example, if all inanimate objects behave in a certain way, living objects also have *their* characteristic modes of behaviour which are not shared by inanimate bodies. Organisms, for instance, repair themselves and reproduce themselves, generate and expend their own energy, and act in a variety of ways unparalleled in the inorganic sphere. That is to say, in the organic sphere there is regularity and uniformity, and (if you like to express it that way) 'law'; but the 'laws,' or the regularities of behaviour, operating in the organic sphere, are different from those operating in the inorganic sphere—for a speck of inanimate matter cannot do what an amoeba does, nor a stone do what a bird does.

Then, again, the rational man behaves differently in certain important respects from the mere animal or plant, and can do things of which these are incapable.

The man of science, then, recognises the existence of an ascending series of spheres or levels of phenomena, each of

which is inexplicable from the point of view of the level, or levels, below. For example, the behaviour of organisms is 'inexplicable' from the point of view of inorganic matter, and the behaviour of mind-endowed beings is 'inexplicable' if regarded from the point of view of mere organic life, and, *a fortiori*, from the point of view of inorganic matter. Each level of existence is characterised by its own 'regularities of behaviour,' or 'laws,' if we wish to call them so; thus there are psychological 'laws,' biological 'laws,' physical and chemical 'laws.'

This recognition of differences of quality in natural objects and their behaviour, however, does not involve any interference with the uniformity of nature. Nature may not be wholly uniform in the sense that all classes of objects behave in the same way; it is uniform in the sense that classes of objects have regular modes of behaviour which are (1) ascertainable and (2) uniform.

It has been necessary to labour this point because the recognition of these different levels in Nature is sometimes disingenuously represented as being equivalent to a surrender of the principle of uniformity. But this is not the case. Nature on the psychological and biological, as well as on the physical, level is uniform. Here, too, there exist regularities of behaviour which can be discovered and systematised by observation and classification. The man of science does not have recourse to any theory of interpositions from outside Nature in trying to account for any phenomena which may occur—whether familiar or unfamiliar. Nature for him, though constituted as a hierarchy, is a self-contained whole. Every event in Nature has its cause, as well as its result, inside Nature.

All events, then, for the man of science, are 'natural' events. But though they are for him all natural (and not 'supernatural' or 'miraculous'), yet they are not all to be estimated alike. His belief in different levels of existence, and (what is the same thing) his belief in evolution, enables the student of science to distinguish between different qualities of events and of processes; and to introduce, while not deserting the strictly scientific and 'objective' standpoint, conceptions of value. He would, for example, place the behaviour of a man upon a different level from the behaviour of a starfish.

And he might say, nor would there be anything in the principles of any of the natural sciences to prevent him saying, that the universe is productive of a series of qualities of increasing value. As Mr. Julian Huxley has put it recently:

> 'There exists a certain general direction of movement in the evolution of living things . . . We find that [this] is movement towards a realization of the things judged by the human mind to have value. It is a movement towards an increase of power, of knowledge, of purpose, of emotion, of harmony, of independence . . . What is important is that the human idea of *value* finds its external counterpart in an actual historical *direction* in phenomena.'[1]

But for the student of science this idea of a world creative of values is not incompatible with the principle of natural causation. 'The fact that something is of the highest value does not preclude a purely natural origin,' as Prof. Höffding has reminded us. The fact is that the word 'natural' for us has come to have a far wider and richer connotation than it had in the thirteenth, or even in the nineteenth, century. As our knowledge of nature has expanded we have come to take a more generous view of its potentialities, and there no longer seems anything incongruous in the idea that even the things we value most may have a purely natural origin. Natural causation and value seem to us no longer incompatible.

We now realize that though the happenings of the world differ widely in value, yet that there is nothing here to prevent all events being naturally caused. And it is this expansion of the idea of Nature, so that it can contain all our highest values, which is characteristic of the modern way of looking at things. As in the New Testament times the supernatural swallowed up the natural, so that everything of value seemed of supernatural origin; so to-day the natural has swallowed up the supernatural, so that everything of value seems of natural origin.

An attitude such as this, as it has no room for the supernatural, certainly has no room for the miraculous in the Thomist sense—as interposition from outside nature. And the question has to be faced whether it has any room for an incarnation in the traditional Christian sense, involving something 'coming in from outside,' an invasion accompanied by

[1] *Essays of a Biologist*, pp. 59 *f.*

congruous events caused 'from outside,' *i.e.* genuinely miraculous in character. But here we should remember that the traditional Christology has identified that which was made incarnate with the creative process. And there can be nothing incompatible between this traditional view and the modern view. Yet such a view, logically, involves no breaches of natural law. The incarnation, so understood, may be an entirely natural process.

It may indeed be urged that the 'incarnation' as understood by Christian theology, was an 'intrusion' in a unique and 'supernatural' sense, rendered necessary by the fact that the creative process had somehow gone astray at the Fall and had to be brought back on to right lines. It had somehow got checkmated, and there had to be a special, or supernatural, re-introduction of it, in order to get things started again; and this special or supernatural re-introduction of the creative process was naturally accompanied by special and supernatural events.

This, however, though it may seem convincing to some, has the air of being an *a priori* theory to compensate for a lack of historical evidence. It is a theory which cannot be proved, even if it cannot be refuted. This is the strength, or weakness, of all such speculations.

One point remains to be considered. It may be urged that an occasional breach of the uniformity of Nature guarantees, as nothing else could, the *personality* of the power behind Nature. Yet this idea seems based on a misunderstanding of the nature of personality. We can only speak of character, or personality, in any definite sense where there exist unity and continuity, and not sudden leaps into the unaccountable. Ideas of personality need not be incongruous to the creative process merely because that process displays unity and continuity. It may be urged that, on the contrary, the innermost essence of personality is closely bound up with such unity and continuity. It may indeed be truthfully said that the natural sciences, with their ideas of the uniformity of nature and the continuity of natural processes, are discovering in the world that principle of unity which is itself the essence of personality.

The principal obstacle in the way of seeing personality in the unity of existence has been a misunderstanding as to the nature of that unity. Unity is not necessarily equivalent to uniformity, as our modern Church reformers continually remind us; and to say that Nature is an unity is not to say that it is all on a level, or that there are no such things as values. To reduce reality to one dead and mechanical level may have been the ideal of nineteenth century science, but it is no longer the ideal to-day. We recognize that to interpret the world in the light of its latest product, conscious mind, is better than to interpret it in terms of matter and motion.

We see the world, then, not as a duality consisting of nature and super-nature, as Aquinas saw it; but rather as an unity embracing a whole hierachy of ascending qualities. Thus we sacrifice neither the unity nor its values. If we chose to use the term supernatural to describe the higher qualities of existence, such as life and mind, there is nothing to prevent our doing so. This will distinguish them from the lower, and merely physical, levels. Nevertheless, such a terminology is to be deprecated, as it represents as a duality what is more truly to be described as an unity, or even as a plurality. The enrichment of nature by scientific discoveries is rendering the concept of the supernatural redundant. It will tend, by a natural and almost unnoticeable movement of thought, to disappear.

Belief in miracle, in the orthodox sense, has declined to a remarkable extent during the past two generations; and it will, in all probability, continue to decline. For there is an *inertia* in the world of ideas as there is in the world of material objects. As material objects tend to remain stationary until they are set in motion, but when once set in motion, to continue moving, so with ideas. Our ideas may be extremely difficult to move, but when once the motion has been imparted to them, it tends to continue. It may be hard to learn, but it is far harder to unlearn. We once believed that the sun revolved round the earth. It seemed a reasonable belief, and we held to it conservatively until it made us uncomfortable to think so any longer. It was difficult for mankind to change its mind on this point; but that difficulty was nothing to the difficulty which it would

experience in changing its mind back again. The parallel in the case of the miraculous is exact.

Perhaps the surest way to retard this process of decline in belief in the miraculous is to elaborate arguments against it. Hence this paper may have done service to tradition. To attack a belief is sometimes to give it new vitality. 'Leave them alone,' was the advice given to those who were over-anxious to refute the Pharisees. There are theories that refute themselves, or rather, which are refuted by the facts of experience. Events constitute the best logic; and perhaps a writer in the *Modern Churchman* laid his finger on the spot when he said the war killed the belief in miracle; for if God can interfere to change water into wine, the question arises why He does not interfere on other, and (as it would seem) equally important occasions. From the traditionalist point of view it is difficult to find a satisfactory answer to this question. While on the view taken in the paper the question simply does not arise. The scientific and philosophical difficulties raised by this dualism of the natural and supernatural are perhaps less serious than the moral difficulties of this kind.

We need to disincumber our religion of this incubus of the supernatural—or rather of the dualism between the natural and the supernatural. It no doubt served a useful purpose in the hands of Aquinas, who was faced with a barren naturalism which he somehow had to baptize into Christ. He did his work only too well. So well that traditional theologians have never been able to tolerate any conceptions of Nature but those which represent it as barren, and, as we may say, de-theised. To say that our values are sprung from the womb of Nature—seems to them equivalent to a denial of those values. They deprive Nature of divinity in order to give the greater glory to God. It is better to recognize that this barren 'Nature' is a figment—an abstraction.

They take away divinity from Nature, and compensate Nature by annexing to it the Supernatural. But the procedure, though it gives with one hand what had been taken away by the other, is artificial, and, what is more, misleading.

Why commit this robbery in order to make this elaborate recompense?

IMMORTALITY—ABSOLUTE OR CONDITIONAL?

By J. E. Turner, M.A.

IN accordance with the scientific standpoint from which our problems are to be considered, I shall deal with immortality, not from the theological point of view, but in the light of present-day psychology; its theological aspects, then, will be excluded, not because I question their value, but because they would here be out of place. But we shall find that our science ultimately implies a philosophy—we shall be compelled to pass on from the facts of psychology to their philosophic significance; on the other hand, I shall make no appeal whatever to spiritualism or psychical research.

We must recognize, then, to begin with, that the scientific analysis of our problem has very often yielded a merely negative, or even a sceptical, conclusion; the prevailing impression is that the bare facts at our disposal constitute a serious obstacle to any belief in immortality at all. I think that all such negative conclusions, however, are fundamentally erroneous; and I believe, on the contrary, that the psychology of human personality provides substantial grounds for the principle of immortality.

By immortality I mean the continued existence, for ever, of the human individual after the death of his body; 'John Smith,' that is, continues to exist for ever after his body is dead. I do not mean the immortality of values, or principles, or great causes or ideals merely, except in so far as these are manifested by human persons.[1] But such individual immortality does not mean that the individual remains unchangeably the same. On the contrary, he continues to develop in precisely the same way that the child develops into the adult; and this continuous development likewise goes on for ever. Finally, my answer to the question—Is individual immortality, as thus defined, con-

[1] Again, of course, I do not question this mode of immortality; I merely exclude its consideration.

ditional or absolute?—will take the apparently paradoxical form of saying that our immortality is always conditional; but, if the necessary conditions are observed, it becomes absolute.

2. But before dealing with immortality as such, we must briefly consider two preliminary questions. (*a*) Is mind a reality, or is it an illusion or a fiction? Is consciousness real? (*b*) If mind and consciousness are real, what is the nature of the self? How must we describe it?

(*a*) During last century mind, or consciousness, or experience, was looked upon either as not in itself real, or, at least, as being less real than matter. It was regarded as being the accidental result, or product, or by-product, of nervous processes going on in the brain; consciousness was compared to the shadow of a powerful locomotive. This shadow was very often co-existent with the engine, but it did no work; it was *only* a shadow, and in that sense not real, or not so real as the engine. In the same way, the human body or brain was the reality, while mind or experience was an unreal effect or product of brain processes. Without going into the grounds for the position, it must be sufficient to say that the standpoint of modern psychology is diametrically different from this nineteenth century Epiphenomenalism. Mind, consciousness, experience, are to-day accepted as being fundamentally real. Many thinkers, indeed, would go much further than this; they would say that consciousness or experience is the *only* reality. Mr. Bradley, *e.g.* holds that ultimate reality is experience; while Dr. McTaggart teaches that the *only* realities are selves or persons. Personally, I regard both mind *and* matter as being real, each in its own way; mind is mind, and matter is matter, and any philosophic attempt to transform one into the other, I am convinced, is bound to fail. This, however, is here a subordinate issue. The point I wish to emphasize is that, for modern psychology, consciousness or experience is real; it is neither an illusion nor a fiction. We are certainly unable to explain its connection with the brain; but that does not prevent our regarding it as being just as real as the brain is; and many would say that it is the more real of the two.

(*b*) What then are we to say about the self, or personality? Is that also real? and if so, what is its precise nature? Hume, from the philosophic standpoint, denied that there was any per-

manent real self at all. There is nothing, he said, except a succession of conscious states. None of these lasts for very long; they all come into existence and then disappear; all we find is a group or bundle of perceptions or sensations; we can, if we choose, call this bundle a self or a person; only there is nothing permanent; all that exists is a changing bundle of conscious states, every one of which vanishes; beyond these, there is no self at all; and this view, in one form or another, is still found in current psychology.

So far as his description of the *facts* go, Hume was quite correct; only, he did not state the whole of the facts; and the facts which he omitted to take into consideration were by far the most important of all. And this means that we must begin by accepting the truth of Hume's *facts*. Consciousness is in a state of unceasing change. The feelings and thoughts of each one of us change incessantly from hour to hour, from minute to minute—that is perfectly obvious. The question then arises —Amid all this undeniable change, is there anything at all that is permanent? anything that we can truly call a *permanent* self or person? Hume, to repeat, said No; and his denial must be met by facts and arguments, not by saying, *e.g.* that we feel perfectly sure that a permanent self exists in the case of each of us. This feeling, no matter how strong it may be, can constitute no satisfactory proof; for again and again we have felt quite certain about things which we have afterwards found to be false.

3. What then, was the fact which Hume failed to consider? It was the fundamental truth that these incessantly changing conscious states are always definitely organized into a *system*. Multitudinous and fleeting though they are, they always possess organization, structure, system. What I mean will be clearer if we think of the human body. The elements of this, also, are constantly changing; oxygen, blood, food, muscle, nerve—all are incessantly coming and going, nothing is permanent except perhaps the bones; and yet, as a whole, as a *system*, the body remains recognizably the same, and in that sense permanent.

Similarly, then, the psychic contents of our mind also form a *system*—a structure, an organization—that makes each of us what we are, and remains recognizably the same for long

periods.[2] This does not mean, however, that this system never changes at all. On the contrary, it changes constantly but slowly; the infant becomes the boy, youth, man, and yet remains the same in many fundamental respects, both bodily and mentally. Now, we must notice that the human self is not peculiar in this respect. A tree, *e.g.* does precisely the same thing; so does a nation, or a church; its citizens and members come and go, and yet it remains recognizably the same. Some permanent *system* always exists; and it is this system—this organization—which constitutes, in my opinion, the real and permanent self.

So far, then, we have two important results; the human self is *real*, and it is *permanent* or persistent. But these results apply only to this life; they do not establish individual immortality. For we can say precisely the same thing about a dog or a horse; it also is a system, real and persistent. So is a tree, for that matter, or an oyster; and yet we find no difficulty, but rather the reverse, in looking on dogs and trees as not immortal. Human immortality, therefore, must be based on some still further considerations. Why should that system which we call a man be immortal, while the system which constitutes a dog not be immortal? Our reply, it must be remembered, can be neither emotional nor theological; it must be based, to begin with, on psychological principles.

4. But it will help us to place a proper estimate upon these principles to consider here the answer that is often given to my question. Very often, then, we say that humanity is immortal, while animals are not immortal, because man possesses a far higher *value* than any animal possesses. Now I want to take that assertion, and ask what meaning we can give to it in the light of modern psychology. In other words, does the analysis of human personality reveal any characters that can be regarded as making that personality so valuable in the universe that it deserves to continue for ever? Has the self any function or activity—does it fill any place in the universe—that merits immortality?

I think these questions must all be answered in the affirmative; and in order to arrive at such a conclusion we must ask—

[2] This standpoint is adopted by Dr. Stout; *Groundwork of Psychology* (1903), p. 8.

What is the fundamental difference between the human mind, and the mind of every animal? This fundamental difference consists, at bottom, in the capacity for *thought* which humanity, as such, possesses. In order to prevent misunderstanding, however, two points must here be noticed:

(*a*) The human capacity for thought has evolved, by a continuous process, from the level of the animal mind; there is no necessity, that is, to account for man's thinking power by any exceptional creative act; it is, on the contrary, just as natural as his skeleton.[3]

(*b*) I do not mean that the power of thought is the *only* difference between man and animal; obviously it is not; but thought forms the *basis* of all the other differences; it lies at the root of human freedom, morality, art and religion alike. But 'thought' must be given no narrowly logical meaning, but as wide a meaning as possible. It means understanding, reason, rationality, intelligence, in every possible degree—from the level of the ordinary intelligent man in the street to the genius of a Shakespeare or an Einstein. This capacity for thought lies at the root of our free will, our religion, our art and our civilization; destroy reason, and all these must straightway perish. Our next question then is—How does this human capacity for thought or reason bear upon immortality?

Let us return here to the consideration of the *evolution* of consciousness or of mind. What is the outstanding characteristic of this evolution, when we view it as a whole and apart from its complicated detail? We find that while mind begins at a very low level, so that at its origin mind is subordinate to the body, as evolution proceeds this relation between mind and body is slowly but steadily altered, with the result that the body becomes more and more subordinate, while the mind becomes more and more dominant. Consciousness, we may say, first appears as the 'bottom dog,' and the body as 'top dog'; but as mind and body evolve the situation changes, so that at last mind becomes 'top dog'—becomes the active, predominant member in the mysterious partnership between mind and body. The mind of the higher animals *e.g.* remains the servant or instrument of the animal body. But as reason slowly evolves,

[3] If we make any appeal to creation at all, it can be only to creation as universal, not specialized.

the human mind appears; and yet the mind of the savage is also the instrument of his body, although to a far less degree than in the case of animals. But as savagery is left behind, the human body becomes the instrument or servant of the human mind; this is plain fact. But its significance is all important, in two respects. (*a*) It means that our minds—our personalities, our selves—have now acquired a certain degree of *true independence*. Of course, if we accept the facts of spiritualism, or the results of psychical research, we may believe that mind has an *absolute* independence; but, as I have said at the outset, I wish to leave these phenomena entirely out of consideration. In the sphere of ordinary life alone we find the self as an organized system which is *real*, and which enjoys a certain measure of real *independence*. (*b*) We find, further, that the *entire course of evolution*, both bodily and mental, has led up to this result; and I think that we are therefore perfectly justified in arguing, from the evolutionary standpoint, that the *purpose* of evolution is to use the human body as an instrument—agency, means—for the ultimate production of the self as a reality which becomes more and more independent, which exists more and more in its own right.[4]

Here, however, we have to face all the difficulties that arise from the intimate connection between consciousness and the brain. The facts are sufficiently well known; what can we make of them? I think we are entitled to argue that the self, having thus acquired predominance and a certain degree of real independence, ultimately becomes capable of existing alone quite apart from the body. From the very conditions of the case we cannot *prove* this, unless we accept the results of psychical research. But we can pursue our argument as far as it will lead us, and then there is certainly nothing to forbid, but on the contrary very much to support, the idea of personal immortality. The self—person—individual—has both a *real*, and an *independent*, existence; this existence then *may* continue after the body has ceased to function.

5. This suggestion—it is not a proof—seems to find further support from the absolute difference which exists between

[4] We may further expand this suggestion, and regard the physical universe as the means for the evolution of a spiritual universe; but not in Professor Alexander's sense in *Space, Time and Deity*.

matter and mind. I maintain that both are truly real; matter is in no sense mind, nor is mind any form of matter. Nevertheless it is extremely difficult for us to realise this reality of mind; consciousness is so intangible—imperceptible—elusive—as compared with wooden chairs and tables—not to mention wooden heads. But if we look at this difference from another point of view we may argue that mind is so *absolutely different* from matter that it enjoys its own form of reality quite *independently* of matter. The conditions of real existence in the two cases are so fundamentally different that we cannot argue from one to the other; we cannot argue, therefore, that mind can exist only while the brain exists; once again, because of its very nature as contrasted with matter, mind may exist independently of matter.

So far, then, our conclusions are as follows: the self is a *system*—is *real*—is predominant over the body—is acquiring a greater and greater measure of independence—and finally therefore may be capable of existing independently of the body. But, once again, this does not constitute any sufficient basis for the principle of immortality. Let us, however, bear these results in mind, and consider a little further the question how the human capacity for thought bears on immortality. I have said this capacity lies at the root of everything that is distinctive of the human mind. It is certainly true that animals can think; but their thinking powers always remain rudimentary; they cannot expand to any appreciable degree; man alone can reason and know in any developed manner.[5]

Now let us ask: What is thought—reason—knowledge? What is its purpose? Bergson tells us that the human intellect is an instrument, and that it distorts the nature of reality; it misleads us; practically it is indispensable, but it is nevertheless quite unreliable; we must turn, he argues, from thought to 'intuition.' I refer to Bergson, however, merely to say that I disagree fundamentally with his entire position. In absolute opposition to Bergson, thought—reason—lies at the root of our apprehension of the nature of the real universe. Thought gives us knowledge; and knowledge is always knowledge of *reality*—of the *real universe*—the philosophic standpoint at once of

[5] This becomes clear if we compare any exceptionally intelligent animal with a child of five.

modern Realism and of the Idealism of Plato and Hegel.[6] In principle, when we know, we know *reality*—we apprehend the universe, never, of course, exhaustively, but always in part, however small that part may be.

But still further, our knowledge is always *expanding*; and there is no reason whatever to believe that this expansion will ever cease. In fact, the psychology of knowledge proves that knowledge *must* expand, from its very nature; as indeed we see it doing every decade; so that in the coming centuries our modern science will seem like childish prattle; so much, I think, is undeniable; and this expansion, in principle, is unending and inexhaustible.

6. The self, therefore, in thinking and knowing, is in *direct contact with the real universe;* and this contact becomes ever closer and ever wider, both in the individual and in the race. Now what is the result of this unceasing expansion of knowledge? The answer is again of fundamental importance; for knowledge—reason—controls our action and determines our behaviour. Here again we perceive another absolute difference between man and animal; animals act instinctively, man acts rationally. Not always, it will be said; very often we act from impulse and passion. This is true—too often disastrously true; but the reply is simple. Whenever we act from passion and impulse *alone*, we descend to the animal level from which we have slowly evolved; we cease, for the moment, to be human; and the cause, in psychological terms, is that reason has abandoned the reins of impulse.[7]

As mankind advances, in other words, reason acquires more and more dominance over conduct; we turn from Philip drunk to Philip sober; conduct becomes more and more rational; but we must now express this more precisely; and then it means that conduct becomes more and more determined and influenced by ideas; we set some idea or concept, more or less definite, and the more definite it is the better, before ourselves, and then we act in such a way that this idea becomes realized. In this way reason becomes more and more inti-

[6] In our own country this principle is maintained by Mr. Bradley and Dr. Bosanquet. *Cf.* 'The Failure of Bergsonism,' *The Monist*, vol. xxxiii. p. 219.

[7] *Cf.* Plato's well-known illustration of the charioteer.

mately connected with conduct; that is the essential difference between man and animal, between civilization and savagery. As I have said already, it is not the *whole* difference between them, but it lies at the root of all other differences.

But here we must advance a step further. I have argued that the self becomes increasingly rational; but still further, rationality becomes more and more intimately united and fused with our conduct. This is, I think, a perfectly obvious fact; but we must ask: What is the significance of this fact? What does it really mean? It means, at bottom, that the self becomes not only a *rational* self, but also, and at the same time, a *moral* self, capable of choosing between the concepts of good and evil, and of acting upon its own choice. Here again we find the absolute contrast between man and animal. No animal is fully rational; man is: no animal has a truly moral nature; man has: no animal has a real will; man has; animals live not by will but by instinct. But these things are all inseparably connected together. Morality is not one thing, and reason another; moral nature, rationality, and freewill are only different aspects of one and the same developing self.[8]

7. The evolution of rationality, then, consists in the development of ideas or concepts in the mind; these ideas always influence our action, thus taking the place of animal instinct and impulse; these ideas, again, are either of good, or of evil. Our conduct and character, therefore, become good, or bad, according as we choose and realize ideas of goodness or of evil. This result is not altered by calling these 'ideals'—good or bad ideals as the case may be. For every moral or ethical idea must also, and originally, be an idea—a concept—the product of thought; this becomes obvious when we recognize that every moral ideal can be given intellectual and articulate expression as, *e.g.*, in a sermon, or a treatise on ethics.

Rationality and morality, then, are inseparable; they inevitably develop together; in acquiring reason, man at the same time acquires a *moral* nature—he becomes conscious of the fundamental distinction between evil and good, which no animal can recognize. And thus we return to our principle that, as the self evolves, its conduct becomes based more and

[8] The earlier view of will as being wholly distinct from reason is altogether obsolete.

more upon its reason and its knowledge. But, once again, what is our knowledge? Knowledge, I have argued, as against Bergson, *e.g.*, is knowledge of *reality*—of the character of the real universe. In ordinary life we see this quite clearly; all the principles of engineering, machinery, architecture, medicine, express some knowledge of the real natural world; and once again, all sane behaviour must conform very rigorously to this knowledge. But this, after all, constitutes only the *lower* levels of reason. Having thus apprehended the real *natural* world, rationality develops still further, and apprehends the entire universe, natural and super-natural, or spiritual; but I do not wish to make any absolute distinction between these; the universe, in all its contrasted aspects, is one; and the rational capacities of the self enable it to become explicitly conscious of the nature of this single universe in a manner that absolutely transcends the experience of animals and, further, to incorporate this explicit consciousness in human knowledge, the product of human thought or reason.

8. The knowledge possessed by the self, therefore, has a dual character; (*a*) it keeps the self in direct contact with the real universe; (*b*) it influences his conduct. We may then sum up the entire situation by saying that it is fundamentally characteristic of the human self that it ultimately becomes capable of acting in response to the nature of the universe as a whole. No animal can do more than instinctively respond to its *natural* environment; man, in virtue of his reason and knowledge, can freely respond to an environment that is *universal*, natural and spiritual at one and the same time. It may be said that hardly anyone does this, and again this is sadly true. But every great genius—every great leader of the race—always acts in response to the nature of the real universe, as he understands it; and each of us, in our best moments, does the same in principle.

Here I must take a leap in the course of my argument, because space does not permit a detailed analysis. I shall describe this free response of which the human self is capable as his effort to realize more and more fully the *moral order* of the universe; this may be called the *divine* order; the point I wish to emphasize here is that the *divine* order is also essentially a *moral* order; and here we reach the final stage of my argument.

For we must recall that the evolution or expansion of human knowledge and rationality has no limits; it may, in principle, go on for ever; and this means that the self may go on developing in reason, knowledge, emotion, and conduct, for ever, always achieving a fuller response to the *moral order of reality*, and realizing this order more and more completely. The self, in other words, is capable of occupying an important place, and fulfilling a valuable function, not merely in the physical world like an animal, but in the spiritual universe; a place, further, which becomes ever higher and ever wider. The self possesses the capacity, therefore, not merely of *existing* for ever, but of *developing* and evolving for ever. But we found previously that the self is both real and permanent, and has a nature independent of the material order. Here we find, still further, that its permanent reality has an ever increasing *value* in the real universe. Its reality, therefore, need not necessarily terminate nor be destroyed, but may continue for ever.

It is here, I think—in the consideration of all these various facts in their bearing upon each other—that we find the *psychological* basis of immortality; and if we add that this continuous existence of the self must always depend on its recognition of the universal moral order, we obtain the *moral* basis of immortality. Immortality, then, to conclude, is not absolute.

The human self is not immortal because it is a *self*, or because it is human; is has, in other words, no *absolute and indefeasible* claim upon immortality. The continued existence of personality is always conditioned by its relation to the moral or divine order of the real world; so that, from this point of view, immortality is conditional. On the other hand, if the self recognizes and obeys these conditions, its immortality at once becomes absolute. Immortality resembles the freedom of the citizen; our civil and political freedom is rigorously conditioned by our observance of our country's law; but, so long as we do observe this, our freedom remains absolute. The human self, however, is a citizen not merely of a nation, but of the universe; and his citizenship is eternal and absolute, if he will obey the law of the universe.[9]

[9] I may add that my argument is not intended to exclude the principle that the self is always associated with some form of body; this, however, is a distinct problem from immortality in itself.

THE SACRAMENTAL VIEW OF NATURE

By the Rev. RICHARD HANSON, B.D., Chaplain of King's College, London.

THE sacramental idea is expressed in the familiar words, 'An outward and visible sign of an inward and spiritual grace': but what is Nature?

There is no more elusive concept in the history of philosophy. 'Nature' has been used in an endless variety of ways to cover the ground which lies between the idea of a visible vesture of God, revealing as garments must much of character and purpose, and the idea of a simple indentification with God, the '*Deus sive Natura*,' for example, of Spinoza. It would seem that a preliminary definition of Nature is a necessary prelude to any discussion of Nature's significance and purpose, sacramental or other.

Such a definition cannot be attempted here. It would involve the exposition of a complete body of metaphysic, a task far beyond the limits of this paper and the capacity of the reader of it. Descriptive generalities rather than logical deductions must be the method of procedure. This is a method—if indeed it be a method—so liable to abuse that a word of warning and of justification is needed at the outset.

We may describe the situation in this way. Reasonable men of all parties are agreed that some kind of re-statement, or at least re-presentation, of the essentials of Christianity is a vital need of our age. There is nothing new or alarming in this. Such re-presentation has in some degree been a necessity, and has in fact been effected in every age. But in the past, speaking broadly, the work of re-presentation has been conducted in the atmosphere and very largely in the terms of one great philosophical tradition. I mean, of course, the Platonic-Aristotelian tradition, whose most systematic presentation for dogmatic purposes is found in the splendid and massive synthesis of Aquinas. You will perhaps desire to overwhelm me with exceptions. I grant the exceptions, if you will admit the rule. There has been,

I maintain, a pervasive background, a generally acknowledged scheme, a determined habit of mind generally admitted and assumed as a common heritage and conviction by all parties, Catholic and Protestant, Puritan and Latitudinarian. It is not Aristotle *pur et simple*, but Aristotle, so to speak, with infinite variations, Platonic, Stoic, and so on.

Now the offence of Modernism and its distinguishing mark is that in the perennial struggle for re-presentation which marks every age, it has in this age dared to move the previous question. It has expressed a growing dissatisfaction amounting in the aggregate to an emphatic denial of the hitherto generally accepted *schema*, it has questioned the finality of that pervasive background. It seeks to employ in the expression of the common Christian heritage a view of Nature (and that necessarily involves views of God and man) radically different from that which is employed in the traditional formulae. The task is one of extreme difficulty just because there is not, as in the traditional view, a generally accepted metaphysic. The metaphysic of Modernism is in the making, both as regards methods and results. It is this fact which justifies, or at any rate renders inevitable, that procedure by a method of descriptive generalities rather than by logical deductions to which I have referred.

The revival of interest in the philosophy and theology of Aquinas displayed by the more intellectual element in the Anglo-Catholic party is a fact of great significance. It means, or at least it should mean, that the philosophical foundations of Catholicism are being re-examined at the fountain-head by men of great practical ability and of intense spiritual fervour. Our generation is likely to witness within the bounds of the Anglican Church a re-statement of the traditional metaphysic and theology which with the full weight of a long-tested and widely-accepted method behind it is likely to possess great cogency for many minds. The production of a rival metaphysic which, while giving adequate expression to the modern *Weltanschauung*, shall at the same time be a satisfactory vehicle of the great central truths of Christianity is a Herculean task. It is, I would venture to suggest, *the* task, par excellence, of the Modern Churchmen's Union in the immediate future: a quite definitely constructive and intellectual task, without which the

most convincing destructive criticism of mediaeval methods and the most brilliantly expressed emotional reactions against their modern revival can have only a personal and an ephemeral interest.

I am anxious not to sail under false colours. I am most heartily desirous to see a revived interest in Aquinas. I hope I may live to see within the Anglo-Catholic party the revival of a sound scholasticism providing, as I believe scholasticism in the broad sense can alone provide, a reasoned basis for the distinctively Catholic expression of Christianity. I would do anything I could in a very humble way to promote and further that revival. But I am equally desirous to see and to promote a distinctively Modernist metaphysic, which will provide a reasoned basis for the Modernist point of view. The cleavage between the traditional and the modern in every sphere of human activity presents, in my opinion and in our time, the most serious crisis which Western civilization has yet faced in the whole course of its history. Before I come to any final decision, I want to know what are the implications as to the ultimate reality of the universe involved in each of the contrasting views. Let us try to tell one another not how we *feel* about it, but what we *think* about it. We have, perhaps, for the present liturgies sufficient for all our purposes: but has the Anglican Church logic enough to go round?

The Catholic view of Nature is at any rate logical through and through. Admit the broad metaphysical scheme, the all-perfect Being with His infinite attributes, the ordered hierarchy of created beings, the deliberate expression of His love and purposes, the unique being self-conscious man at the top of the scale with his abstractive intellect and his spiritual affinities, and there follows at once that view of Nature as possessing a certain reality and permanence of its own, yet ultimately dependent upon and expressive of eternal perfection, controlled by divine law yet responsive to divine intervention, a visible ladder pointing in its ordered sequences from earth to heaven. It is quite specifically a sacramental view. Nature is, broadly speaking, for man occupying the position he does in this view, an outward and visible sign of inward and spiritual grace. I do not elaborate its significance, for we are all familiar with it. It is

the traditional Christian view. But all the more because I do not dwell on it in detail, I wish to emphasize the fact that it is a profoundly metaphysical view, a matter of rigid logical deduction from definitely stated premisses. It is not reducible to or expressive of a mere emotional reaction or even a series of more or less intellectual impressions. It is an integral part of a highly complex, exhaustive and profound metaphysical system. It is a logical implicate of the divine transcendence; a strictly necessary conclusion of the logic of transcendence, the Aristotelian logic of the syllogism, when used as the instrument of a Christian theology. For the Aristotelian logic, the logic of subsumption and classification, of deduction and abstraction is the prime strength of the Catholic system *qua* system. I am not aware that divine transcendence in the traditional sense has been adequately expressed in the terms of any other logic.

What is the source of the dissatisfaction with a view so profound, so attractive, so eminently to all appearance Christian? And why is dissatisfaction confined, as I said at the outset, for the most part to descriptive generalities and devoid of the same logical cogency which is claimed for the traditional system? The dissatisfaction is due to the pervasive influence of immanental views of reality characteristic of the whole trend of modern thought: and it is this, in its turn, of course, which is the metaphysical expression of that cleavage between traditional and modern which marks the crisis through which our civilization is passing. The lack of logical cogency in the expression of the dissatisfaction is due quite literally to a lack of logic, for the logic of immanence is still in the making, despite the genius of Hegel. May I suggest to members of the Modern Churchmen's Union that the quest of the logic of immanence is a more profitable employment just now than the quest of the Historic Jesus.

Meanwhile we have to be content with descriptive generalities from the Modernist, and we have no right to blame him if he cannot deduce his *Weltanschauung* from post-principles, for the modern *Weltanschauung* is all in the making, and the Modernist may claim if he likes that he is helping to make it. But he must not claim that he has delivered the goods before they are made. It destroys credit.

With all these provisos and explanations, designed to create the kind of mental atmosphere in which I would desire to say my say, is it possible we may ask to justify in this broadly descriptive way a view of nature which is at once immanental and sacramental? If we accept the modern *Weltanschauung* in those broad features of it which are now apparent, can we say in any sense analagous to the old traditional sense that nature is an outward and visible sign of an inward and spiritual grace?

I think we may. There is in the first place the very impressive fact with regard to the significance of sense-data. On the immanental view which is, of course, broadly speaking the evolutionary view, our senses are quite strictly the product of the evolutionary process, having the purely utilitarian result of survival for the species. It is because sight and hearing and touch and taste, as we experience them, proved by a process of trial and error, to be beneficial to the race of man that they are what they are. Such is the theory, which seems to be satisfactory to those who are competent to form an opinion. Nature we may say in our descriptive, pictorial way, has done that. Through our sense organs we appreciate sense-data which are sufficient guide to the organism in all the activities of his existence. But this is not all: it is less than half the whole truth. These same sense-data, as a matter of brute empirical fact, serve further quite extraneous purposes. They lead back as the ground and occasion of the logical activity to a purely speculative reconstruction of the ultimate forces behind immediate experience: they are the material of the scientific and speculative constructions which possess the character of truth and lead in turn to a vastly extended control over the environment. Indeed, this speculative construction is precisely what we usually mean by Nature with a capital letter.

And there is more still. These same sense-data lend themselves in some way, which has never been explained, to another and quite distinct activity of the human organism which we all experience as the sense of beauty. The sense-data, then, are not merely signs of an animal environment: they are capable in response to a further activity of man of becoming vehicles of truth, and revealers of beauty. Now truth and beauty are spiritual if anything is spiritual. So we may say quite liter-

ally in this broad descriptive way that Nature is an outward and visible sign to us of a truth and beauty which are inward, to a spirituality which lies behind the phenomena. That Nature on the purely immanental view points to an inward and spiritual reality behind the purely given cannot, I think, be gainsaid.

But is it grace? Now grace implies personality. Can we then take the further step and say that Nature witnesses to personality? Many men of goodwill would deny that. But keeping to broadly empirical grounds, and avoiding anything like an act of faith, I think we may draw a useful distinction. I think we may say Nature in this immanent use of the term points to personality, without committing ourselves at once to the assertion that nature reveals the activity of a transcendent Person. For Nature in the modern sense of the word, as equivalent to evolutionary process, has as an empirical fact produced personality. 'Man is organic to Nature.' The phrase is, I think, that of Professor Pringle-Pattison. It expresses a conviction of the modern point of view which throws light on the whole situation. For this immanental view points in the direction of monism. It is going too far, I believe, to call it definitely monistic. But it does necessarily break down the clear-cut distinction between those three ultimate realities of the traditional theology God, Man, and Nature. Man, it is claimed, is organic to nature; man and nature are all of a piece. It has been just noticed that on these lines Nature is in one sense a human construction on the basis of sense-data evolved primarily for very different purposes. So, too, probably, though less certainly, beauty with all its implications is a construction due to a human activity on the basis of these same sense-data. Man in a word is nature, growing, evolving, progressive nature, becoming self-conscious and interpreting itself: revealing to itself, or to us, what we call truth and beauty, as spiritual facts in and behind and through the process. The old view, the traditional view, was different. Nature was regarded more as a complete self-contained entity, created by God and revealing to the external contemplation of man something of the Divine purposes and perfections. The general result of the newer view is to throw much more

work, so to speak, on the constructive imagination of the human subject. Man does not merely contemplate nature, he interprets nature, in a sense creates the nature of which he is himself an integral part. Man is the growing point of nature. Nature becomes reflective, capable of self-criticism and therefore consciously free. It is difficult to deny that the freedom is inherent.

Nature, we say, in man has become self-critical; that is to say, self-transcendent. And this self-transcendence appears to be inherent: it seems to be what nature essentially means: nature dies to its dead self in order to live. There are countless instances. I will give an illustration high up in the scale and of burning importance to ourselves. There can be no doubt that at one stage in the evolution of human society internecine warfare between racial groups was a condition of progress. The fiercest and most warlike survived. Yet nothing is more certain than that unless human society can transcend this conception, it will speedily perish, and all the long process be wasted. Nature itself presents a problem which can only be solved by a part of nature transcending what are at first sight nature's own principles. We know now, as a matter of the most commonplace reflection, that unless we do in fact learn to love our enemies, we or our children shall inevitably go down in a welter of irretrievable ruin. Poison-gas is a potent exponent of the Christian gospel, and that in the natural process of history and scientific thought. Nature, which for Huxley was merely hostile or indifferent, is in the wider view, which makes man himself organic with nature's processes, spelling love as the only possible solution for the problems set by itself. So it does not seem to be unduly straining the facts to add the word 'grace' to the words 'inward' and 'spiritual,' and to say that nature may very well be for reflecting men an outward and visible sign of inward and spiritual grace.

Not nature apart from man, but nature interpreted by man, nature in the lower sense transcended in man, and transcended by those spiritual gifts in man which are the latest product of his evolution. Whether a self-transcendent process such as this demands for its ground and explanation an all-inclusive

transcendent self is a further point which there is not time to pursue. But if so, that self must, it would seem, possess the lineaments of Christ: it must be a self-content to find self-expression through self-limitation. God, too, must die to live.

There is nothing new in all this. At the best it is, I repeat, broadly descriptive, and can lay no claim to logical validity or to metaphysical finality. Least of all is it, as it stands, a satisfactory philosophical basis for Christian dogma. It is no more Christian philosophy than Aristotle was a Christian philosopher when Aquinas took him in hand. I venture to emphasize this because I have noticed among some younger liberal theologians a tendency to confuse open-mindedness with clear thinking; they are by no means the same thing. By all means condemn Aquinas all you can, but read him occasionally as well.

Is the breach between traditional and modern really so deep and vital as we are often tempted to think and this paper has implied? There is a great temptation to minimize divergence. It sounds charitable and profound, but it is not, I believe, in the long run conducive to truth or to real unity. We English in particular enjoy dumping small pamphlets into vast intellectual chasms. We call it papering over the cracks. At the present, however, I believe there is most to be hoped from those who are prepared in a good and honest heart and with all the devotion of which they are capable, to explore to the utmost limit all the manifold implications of each of the divergent schools of thought. It is with that conviction that I, with all my heart, wish the activities of the Modern Churchmen God-speed.

FAITH AND THE FUTURE*

'Where two or three are gathered together in my name, there am I in the midst of them' (*Mt.* xviii, 20.)

THESE words, which the author of the First Gospel records as a saying of our Lord, always seem to me to express with concise power Christ's teaching with regard to both Church and Sacraments. When men are gathered in Christ's name, when they join to seek the light of His understanding and the inspiration of His Spirit, He is with them. There is no exaggeration in this statement: our experience confirms its truth. We are strengthened in Christ when we meet to meditate upon the beauty of His life and the meaning of His death, when we test our spiritual needs and desires by His teaching, when we use our knowledge and mental powers to seek to know the Father with whom He lived.

Our conference ends with worship in this Church. Naturally at the meetings intellectual discussions have been prominent, for we met together to consider the relation between modern science and Christian belief. But none the less, ours has been emphatically a religious conference, a meeting in Christ's name. This aspect of our gathering passes *sub silentio*; one says little of the deepest things of the life of the Spirit. But it would be well if those, who read the necessarily imperfect summaries of our Conference which appear in the Press, could realize the religious earnestness which now, as in the past, has found expression in our private talks and semi-private worship. We have gathered together in Christ's name, and we have felt His presence among us.

What emerge as facts of dominant importance when we consider as a whole the papers, the discussions, and still more the spirit of the Conference? First and foremost, I would put the indestructibility of religion. In the varied heritage of humanity there is much to be deplored. War with its organized machinery

* A Sermon preached at the conclusion of the Modern Churchmen's Conference at St. Giles', Oxford, on Sunday, August 31st, 1924, by the Rev. Canon E. W. Barnes, D.Sc., F.R.S., Bishop-Designate of Birmingham.

is a menace to civilization. Various types of superstition are as persistent as they are harmful. But the spiritual ideals of mankind are the source of human progress. And the religious outlook on human life which leads men to find in such ideals the expression of the ultimate nature of the universe, must and will endure. How can I summarize the religious attitude of mankind at its best? Briefly, we are the result not of chance but of Purpose. Thought is not a mere by-product of chemical activity, but a reality more valuable and not less durable than matter. We do not create spiritual values out of the needs of the social life, though we acknowledge that our needs lead us to see the importance of such values, to realize their fundamental place in the eternal scheme of things. It is true, moreover, that we are fashioned by our environment. Physically, mentally, even spiritually, we are products of earth's travail. But the process is not natural, if by the term 'natural' we mean bred by chance out of chaos. Our evolution has been designed. As we have been formed, so now we are taught and led, to serve an end. That end is soul-making, the creation of beings with spiritual understanding and aspirations, units worthy to share the life of the Highest.

Not only do I think that we may conclude that such a generalized religious outlook—if I may so term it—is indestructible but, as it seems to me, we have solid grounds for believing that the Christian faith will continue to be a persuasive inspiration to humanity. Naturally I mean the Christian faith in its essentials, apart from developments of thought and cult by which men have sought to elaborate, at the risk of obscuring, its distinctive message. But I would contend that belief in God as Christ revealed Him, acceptance of the facts of human freedom and responsibility, an interpretation of man's existence which demands the certainty of personal immortality for those who seek to serve God—these essentials are not weakened by our growing knowledge. We can go further. Has God left Himself without a witness among men? The abiding influence, the compelling attractive power of Jesus the Christ, forbid us to think so. Jesus in His life and teaching was God's revelation of Himself. Mystical experience of the highest kind may be rare; but he would be a bold, and I think a foolish, man

who would say that it is becoming rarer as humanity progresses. And, when the flash of mystical insight comes, it reveals Christ as supremely endowed with understanding of God. The way He sought and found God in prayer and meditation; His intuitive certainty of God's nature and purpose; the unfailing perfection of His ethical judgments—all point to the richest kind of spiritual excellence, to a communion with God unsurpassed among the sons of man. Jesus was more than an ethical teacher; His witness to the moral law was a part of His Divine understanding. And for that reason Christianity will always be more than a moral code; it is a religion, a response to and an interpretation of those spirtual struggles that sharply separate us from the animals; it is a light to men who feel compelled to search amid darkness because something within them, some kinship with the Divine, draws them on.

I do not think that any of us here are likely to talk in a disparaging fashion of 'mere morality.' We know that religion without morality is a curse and snare. It has taken millennia to free religion from sexual vice. To free it from the intolerance which breeds cruelty and falsehood is a task so difficult that by it many a thoughtful man is dismayed. Much of the hostility to religion which we can observe to-day is at bottom hostility to the vices which shelter under religious institutions. Christ's condemnation of the Scribes and Pharisees was not a condemnation of Judaism, but of unethical developments within it. He found the accredited teachers of His day disloyal to the faith which they professed. Now such painful truths we must not ignore. None the less, as it seems to me, the only sound basis for morality is spiritual understanding. A man's life is fashioned by the religion which he holds—and that, I need hardly say, may be vastly different from the religion which he professes. Our actual belief in the nature and purpose of the Creator of the universe is the ultimate basis of conduct. To some expediency may seem to be the determining principle; but most men at times realize that loyalty to some absolute standard has been the motive for action; and the success of the principle of 'the higher expediency' witnesses to the fact that the universe is ultimately a God-centred unity. There is, in truth, in the ordinary experience of men much more to

justify the Christian outlook than they often admit. The appeal of Christ to men—its increasing appeal to the best men among the more advanced races of mankind—is not an accident. Our response to Him arises from the fact that we are what we are, or rather that our aspirations are what they are. God, in making us for Himself, has also made us for Christ. Notoriously we are grossly imperfect. Animal instincts and spiritual desires create within us a tension, a condition of instability, from which we long to escape. But there is no escape from spiritual struggle or from the dangerous obligations of righteousness. So Jesus showed conclusively in His life and death. So men learn as they go through life. Christianity, in so far as it is true to its Founder, remains psychologically sound. Speaking for myself, then, I say boldly that religion is not only a most necessary, but also an indestructible element in man's heritage; and that the religious outlook on the universe which is centred on Christ becomes more and not less reasonable as our knowledge and spiritual understanding are increased and purified.

Such are the conclusions which seem to me to be established by our present Conference and by the growing body of opinion of which it is representative. Two subordinate conclusions seem to me worthy of emphasis. First, it is useless for religious teachers to ignore or to minimize the fact that there has been, as a result of scientific discovery and speculation during the last hundred years, a vast change in man's knowledge of the universe of which he is a part. The change began when Copernicus displaced the earth from its imagined position as the centre of creation; it was emphasized when the audacious speculations of Giordano Bruno led him to the stake. The genius of Newton, as we all know, turned the hypothesis of Copernicus into demonstrable fact. But until recently the new astronomy though formally accepted, remained largely unrelated to popular religious belief, and had surprisingly little influence on the imagination even of educated men. It is only since, within the last generation, astronomers have explored the depths of space, and have shown our solar system to be part of a vast aggregate of hundreds of millions of moving suns, that earth's insignificance has been generally realized. Physically the earth is a mere atom in a complicated structure of

inconceivable vastness. Man lives in time, but the whole of the Christian era is but the tick of an astronomical clock. If we are to measure human life in terms of space and time, man is quite infinitesimal. To some these are profoundly disquieting facts. In us here they arouse no misgivings, for we are thus driven to the conclusion that man's spiritual aspirations and achievements, his mental powers, his moral understanding and ethical victories, are the only things that matter. These constitute his sole worth in the infinite scheme. And all the other transformations of outlook which modern science has forced upon us point in the same direction. Man's body has no permanence; chemistry has put an end to belief in a resurrection of this present flesh of ours—it is the spirit which will have immortality, for human life is an absurdity unless man's personality, in so far as it is made fit for communion with God by putting on Christ, is destined for Eternal Life. The whole process of human creation has been the slow transformation of the merely animal by the growth of spiritual understanding. Man we know now to be a cousin of the apes. But God has separated man from the other products of earth's teeming womb by giving him power to share Divine attributes. Not by reason of his origin, but because he has come to know and serve God, man stands apart. The atoms of matter combine and re-combine; possibly there are regions of space where they are made and disintegrated. Out of some of them it appears that life has taken its beginnings; and living things change, evolve and disappear. From the seething turmoil man has been produced. He too will disappear from the earth when our sun grows dark. But he has spiritual consciousness. God has made us for Himself. We can share in the eternal values of the universe; and thus we are sons of God.

I need not insist upon the far-reaching character of the recent change of outlook. From an earth-centred universe we have passed to a knowledge that the earth is a minor planet of one among some two thousand million suns. From belief in a special creation six thousand years ago we have come to picture life evolving on this earth for a hundred million years. Time and space have widened out till we are lost in immensities. The local Heaven and Hell of medieval fancy have passed away. And, because of our entire inability to imagine the exist-

ence of consciousness apart from some living material organism, belief in the reality of a future life has for the mass of men become increasingly difficult. So we witness such phenomena as the growth of spiritualism. Science must give back what science has taken away. Evidence for survival may be weak; the religious value of such as is offered may be of the slightest; but a drowning man will catch at a straw. The different pseudo-scientific cults and the so-called systems of new thought which now abound testify to the enormous confusion in religious belief to which the spread of popular science has led. Because men imagine that Christianity is tied to an obsolete scientific *Weltanschauung* they seek for some alternative. We must not merely deride the pathetic ignorance which is thus shown. Men of science have created a new world. It is their duty to co-operate with philosophers and theologians and to show the place which religious faith must have in the new order. No one who has attended the present Conference can fail to perceive how naturally the essential doctrines of Christianity cohere with the modern outlook. The setting in which Christian dogma has been placed in the past is obsolete. But it is the background of traditional theology rather than its fundamental principles that we need to set aside. If only the ideas which have found expression at this Conference could be given popular form, the end of the present painful period of religious unsettlement would be in sight.

Side by side with the certainty that the new knowledge of humanity cannot be ignored by religious thinkers I would put a second conclusion which our Conference has emphasized. We cannot discover in the past that perfect scheme of faith which we instinctively desire. Two opposite tendencies naturally show themselves at any time of popular religious unrest. There are, on the one hand, attempts at reconstruction which, when made by the ill-equipped, are usually both extravagant and feeble. On the other hand we are offered the comfortable assurance that some synthesis or record of the past is miraculously perfect. Thus to-day we find conservatives dividing themselves into two classes; those who maintain still that the Bible is inerrant and those who cling to the belief that a perfect deposit of faith has been preserved by the Catholic Church. The necessity of defining this deposit shows itself in a growing

tendency to exaggerate the value of the work of St. Thomas Aquinas. Now of these two conservative tendencies, veneration for the Bible is the more reasonable. Until quite modern times the Bible was treated as substantially infallible by all Catholic theologians. The system of Aquinas is practically based on this assumption. The discoveries which make it impossible for us to claim that the Bible is free from error equally forbid us to make any similar claim for some past synthesis of dogma. Thus the extreme Fundamentalist and the Catholic positions are equally unsatisfactory. The ridicule with which Erasmus assailed scholastic theology has not lost its edge. Were Erasmus alive to-day the knowledge of our new Renaissance would afford him further material with which to barb his criticism. We have, in fact, passed away from medieval thought. We may admire its subtlety; but many of the assumptions of medieval thinkers are quite obsolete. So, as I see the matter, the ark of fancied safety to which our Catholics flee is even less likely to avail against the deluge than the simple reliance on the Bible which served their forefathers. Modern Churchmen replace simple reliance on the Bible by an intelligent and critical appreciation of its value. They are of all Christians, the most earnest students of scripture; and they claim that accurate study, so far from chilling devotion, strengthens faith in Christ. The Bible gives us the historical basis of Christianity. In it we have the record of what was truly a Divine Revelation, of the greatest religious movement of ancient times which culminated in the appearance of Jesus Christ. Just as medieval thinkers took that record and, in the light of their knowledge and thought, shaped Christian dogma, so we to-day must proceed. We here know that a reasonable system of faith and thought cannot be derived from the theories peculiar to Anglo-Catholicism. The earnestness and zeal of Anglo-Catholics make only the more pathetic the fact that their system is a hybrid bred by fear in the Victorian era. The Liberal theology of which its founders were afraid is worthily represented in this Conference; it expresses, as we believe, the invincible march of the Spirit of God. In Latin Catholicism the ancestral sacramental paganism of the Mediterranean races is veneered by Christian sentiment. To attempt to graft it on to the English Church is

hopeless. The Englishman will not lean on the priest and the sacraments even though he be given that permission to sin boldly which Tyrrell, himself a Jesuit, accused the Jesuits of allowing. Therein our Englishman, though he may be a bad Catholic, is a good Christian, for it is certain that Christ gave neither the command nor the permission. I see no reason to believe that Jesus would have found fault with our national habit of mind which puts the consecration which comes from hunger and thirst after righteousness before the most splendid ceremonial that man can devise. God consecrates. He is limited by no mechanism. Our Church order is seemly and useful, but has no exclusive spiritual significance. The man in whom the spirit of Christ is active is Christ's minister.

Let me repeat that English Modernists, as represented by this Conference, are wrongly accused of disparaging the Bible. On the contrary they affirm the unparalleled spiritual excellence of the Revelation which it contains; and they seek to combine the Revelation with modern knowledge, to give a re-formulation of the Christian faith adequate to the mental, moral and spiritual needs of our own day. In so far as English Modernists have this aim, they can claim to be more truly Evangelical and more truly Catholic than any other party within the Church. They are Evangelical because they accept the Gospel of Christ as their religious standard, and not some competing theology or semi-pagan variant of Christianity. They are Catholic in that, like all the greatest Catholic theologians of the past, they seek to make a system of faith by combining the fact of Christ with their own knowledge and spiritual experience. I cannot doubt that the future is with them. Misrepresentation and misunderstanding they cannot hope to escape. The pioneer who seeks to alter established ideas must expect conservative opposition, and of all ideas, those associated with religion are most tenaciously held. But, in the long run, truth must prevail. We must not break with the past light-heartedly, but because 'soberly, discreetly and advisedly' we seek truth in Christ by the help of the fuller knowledge of His Universe which God has of late given to mankind. A century hence the majority of Christians will accept the general standpoint taken at this Conference, and be surprised that at the beginning of the twen-

tieth century it aroused so much disquiet. Differences of worship, of Church organization, and, in minor matters, of belief, will persist among Christians. They exist at the present Conference. Men are not made to one pattern. There is no reason to believe that God likes uniformity. But Christians are imperfectly loyal to their Master unless in Him they can find unity. By loyalty to the truth and a steady effort to be worthy of Christ we ought to be able to show men how to create out of its present discordant elements the Church Universal of which we dream.

THE CHRISTIAN INTERPRETATION OF THE UNIVERSE*

'For the invisible things of Him since the creation of the world are clearly seen, being perceived through the things that are made, even His everlasting power and divinity' (*Romans* i, 20).

THERE is perhaps no more flagrant example of the absurdity of translating St. Paul's Greek word for word than the English version of this text, which makes nonsense of one of the great apostle's most weighty sentences. Before I comment upon it, therefore, I must try to offer an intelligible rendering. It is this: 'For ever since the creation of the world His invisible attributes—His eternal power and majesty—have been visible to the mind's eye through His works.'

That sentence was written with references to ancient Greece and Egypt, where philosophers, meditating upon the observed facts of nature, as presented by the rudimentary science of the age, had constructed an image of the divine nature in which, as in the Hebrew religion, power and majesty were the leading features, but love scarcely found any place. But like many great sayings of poets and philosophers, these words of St. Paul, in their limitations as well as their affirmations, are capable of a much wider application than the author intended. They have a bearing not only upon the age for which they were written, but upon all the centuries which have followed: and

* Sermon preached by Canon M. G. Glazebrook, D.D., on September 1st, 1924, in St. Giles' Church, Oxford, at the conclusion of the Modern Churchmen's Conference.

not least upon our own time. Indeed they might well have been taken beforehand as a motto for the Conference of Modern Churchmen which ends to-day, or as an epitome of the conclusions which may be deduced from its debates.

The fact that such a Conference should be not only possible, but fruitful, is an important sign of the times. Early science was generally in harmony with religion, because its method, like that of theology, was to start from assumed principles and try to deduce the facts from them. But ever since Bacon taught science to start with observing the facts and so try to arrive at the principles, there has been a widening breach between science and theology, whose traditional method was entirely deductive. A time came when an astronomer could sweep the sky with his telescope and declare that he could not see any trace of God in the heavens, and another scientist, when asked about the Creator, replied, 'I have no need of that hypothesis.' Science, which had long been kept in pupillage by theology, revolted with violence against its constraint, and essayed to construct a theory of the world independent alike of philosophy and of religion. This revolt was not only a reaction against constraint: it was also a protest against the deductive method, and against the tenacity with which the Church held on to views of nature and history which had long been proved erroneous. Fifty years ago men began to fear that there could be no reconciliation between those who sought truth in nature and those who sought it in the supernatural. A paradoxical and pathetic situation! Truth can be but one. How could seekers for truth be so blinded to each other's aims and each other's sincerity?

Gradually a change has come about. Theologians—all too few!—have studied science, and have realized the overwhelming importance of its conclusions. Students of science have learned the limitations of their sphere. Looking over its edge they have seen that a world of spirit lies beyond—a world which their methods may indicate but cannot explore. So each of the two parties has come to feel the need of the other's help in the great quest which is the life-work of both alike. It is not all, nor even a majority, who are drawn together thus: but their number is large enough to give promise of a solid alliance in the time to come. The Conference of last week is one of the

early fruits of this movement of mutual attraction: and its striking success is the pledge of greater things in the future. I want to say a few words to you about its significance.

Leaders in every branch of science have been telling the world that behind the physical universe they see with their mind's eye the spiritual, which is the ground and the postulate of existence as they know it. To that general view definite and detailed expression has been given by the eminent men, members of various Churches or of none, who have addressed our Conference. The biologists, surveying the evolution of life and consciousness from different standpoints, unite in affirming that neither life nor evolution can be explained without assuming a spiritual power which emerges in all the successive stages of development. The physicist finds a uniform plan running through the whole material universe, from the atom to the solar system—a plan which involves purpose and therefore personality. The astronomer, ranging through the infinite spaces of the stellar world, reads everywhere the signs of the same light, the same laws of motion, the same constituent elements with which we are familiar in our little world, and pronounces it impossible that the order which pervades the whole amazing cosmos should be due to chance, or to any cause but an infinite personality endowed with infinite power. The psychologist shows how the natural impulses of humanity find their satisfaction only in a trustful and intelligent relation to One who is the Father of all. And again the philosophers, by a different path, which passes through time and being and consciousness, tell us that they have reached a like conclusion.

Such testimony is not to be disregarded. Each of these eminent men, in pursuit of his own studies—studies which not long ago were supposed to be inconsistent with religious faith—finds God to be the presupposition and the goal of the universe as he sees it. So in the twentieth century we have a confirmation of the words which the apostle wrote in the first century—'That which may be known of God is manifest in them.'

God! Yes, but that title is used in many different senses. What do our modern men of science mean by the name? Chiefly, I think, the three attributes which St. Paul mentions in our text. Power, which is displayed in the whole structure of the material universe, alike in the atom and the fixed stars. Power, again,

manifested in the higher stages of being, in the infinitely graduated hierarchy of life and of intelligence. Majesty also, which is implied in the lordship of all creation, that wondrous realm whose vastness and variety are ever growing upon our astonished perception. Majesty, which is the source of all our wondering worship, which uplifts us even as we kneel before it in awe. And thirdly eternity, the mysterious reality which transcends and yet comprehends all the successions of time; which is inconceivable to us and yet a logical necessity of our thought. Eternity, which is the ground of all our temporal experiences, holding them together in a unity which they cannot realize for themselves, and giving a sense to the whole which the parts could never constitute.

If eternal power and majesty were the attributes which the science and philosophy of the first century ascribed to the God whom they found in the world of nature, how much more truly, with how much fuller meaning, may the same language be used to-day! Consider for a moment one simple and familiar example. Several hundreds of years before Christ the author of the nineteenth psalm appealed to the heavenly bodies as witnesses to God's glory. In his day they had ceased to be regarded as living creatures, and were recognized as the unerring instruments of the divine will. Cicero, who wrote a hundred years before St. Paul, composed a treatise upon the nature of the gods, in which he represented the views of contemporary philosophers. One evidence of the divine existence and providence, upon which all alike laid stress, was the silent witness of the heavenly bodies. To the ancients, indeed, whose skies were clearer and their climate warmer than ours, the stars were more familiar and seemed more significant than they are to us. By them the immovable regularity of the fixed stars, the order of the seasons determined by the sun, the labyrinthine movements of the planets, were regarded as unquestionable proofs of the divine governance. No doubt they were mistaken in many of their theories. But the subsequent ages, which have corrected their errors by degrees, have all like them regarded the stars as the symbol of a providential order. For instance, we all know how each part of Dante's immortal poem—the finest flower of mediaeval science and philosophy and religion—ends with an appeal to the stars. Whether in Hell or in Purgatory or in

Heaven, the poet turns his eyes to the stars as the unfailing symbols of the eternal power and majesty. Not only for himself did he speak, but as the prophet of his age, the voice of all that was noblest in his generation. That is the reason why, when Galileo made a revolution in the scheme of the stars, the conscience of all Europe was outraged. It was not merely that, as his accusers urged, he was contradicting Scripture. He was, in fact, removing what to many seemed the visible guarantee of their faith, set up by the hand of the Almighty.

Europe was wrong, and Galileo was right, and when truth at last prevailed men found in the new knowledge the seal of a larger and nobler conception of the Creator. Released from the blue vault which had appeared to shut all the world in, the soul could expatiate in the boundless regions of the newly-revealed solar system, and sometimes take a daring flight beyond to the milky way, which hung like a bright veil before the now more distant heaven. And what of ourselves? Our telescopes have penetrated that veil, and show us a whole universe of mighty suns, beside which ours is but a speck, revolving through distances before which imagination recoils in defeat. For us time and space have, as it were, been enlarged. What is the consequence? He who stretched out the heaven like a curtain has become a more majestic figure than He appeared to Isaiah, or to Dante, or even to Newton. We have more reason than they to bow before the eternal power and majesty. And it is the modern astronomer who takes us by the hand, and leads us reverently into this temple of ineffable glory.

What though, like Moses, we must take our shoes from off our feet as we enter? Some of the old forms of thought, which served to ease us in our path through the lesser world, must be laid aside—nay, have been laid aside by most thinking men. Unconfined by these, our souls walk more easily and kneel more reverently before the throne of Him who is not seated above a material vault, but pervades all infinity, at once present and transcendent.

That one example may suffice. Had I time and knowledge, I could draw a like picture of our debt to other sciences. For each one of them, in various tones, cries Behold your God; and points to a vision more splendid in form and colour than those which blessed the eyes of our fathers.

How thankful we ought to be for such visions! Things which prophets and kings of old desired in vain to see have been revealed to our eyes. But we must not forget that the revelations of science are partial. St. Paul's description of the knowledge of God which was given in Nature is strictly limited. While he mentions power and majesty, he says nothing of love. The same limitations prevail to-day. If the astronomer tells us of the power which is manifest in a wondrous order through boundless space; if the biologist shows us how God bestows life and the light of reason upon His creatures in an unceasing succession: there is none of all the band who can assure us that God is love. Huxley, in a famous discourse, described the system of Nature as a relentless rule, against which the good man must fight to the death. Tennyson, many years earlier, writing of the faith in divine love, cried out that

> Nature; red in tooth and claw
> With ravin, shrieks against the creed.

And last Tuesday we were exhorted to face the fact that science, as such, does not present any picture of a providence which cares for all, nor even for the greater part, of its creatures. It insists, rather, upon the struggle for existence, which destroys a thousand living germs for one that comes to perfection, and develops the virtues of a few favoured men in a soil which is fertilized by the corruption of the many. When, therefore, we ask where is the proof of love, or even of justice, in such a world, the astronomer, the biologist, the psychologist, have as such no answer to offer. They are much in the same position as the Hebrew prophet who proclaimed Jehovah as 'the high and holy one that inhabiteth eternity,' but knew nothing of mercy for the heathen, or even for the majority of his own people. Their conception of God, like his, can be so completed as to be a ground of hope for the individual only by the revelation which God has given of himself in Jesus Christ. Jesus taught that God is the father of all men, that is, that every human soul has in it an element of the divine, which gives it a real kinship with God. And He not only taught it, but lived it, showing in His own person how perfect kinship is identity. If man is in very truth the son of God, his kinship excludes the possibility of his being 'cast as rubbish to the void'; for to share the nature of God, however remotely, is to

be indestructible, and no less to be incapable of eternal corruption. Therefore surely, if not in this life, in the life beyond there must be hope for all. After we know not what course of purification and training, the soul which on earth has been ignorant, sensual, or cruel, may be so taught, purified and spiritualised, as to have a share in the life eternal.

Some men of science are estranged from the Christian Church because they fancy that she still presents the awful travesty of Christ's teaching which darkened her past. Life for centuries was embittered and debased by the nightmare of an eternal hell, in which not only the sinful but the merely ignorant should suffer endless torment, eternally rebellious and unrepentant. Thus the soul of man, instead of possessing infinite value, as Jesus taught, was a thing which most men would be wise, if possible, to throw away. No wonder that science and common sense alike have revolted against a belief which represents God, not as a father, but as an arbitrary tyrant! No such doctrine could complete or amend the conception of God which was derived from the study of nature. But Modern Churchmen have not so learned Christ. Having returned to His own teaching, and sought to see the heavenly Father through His eyes, they have an answer of hope to the obstinate questionings of the many, who are shocked or frightened by the hideous facts of sin and suffering in this life, or by the blasphemous threats of everlasting torture in a life to come. They can say to the world of science and of common sense that, in spite of all the obvious difficulties, Christ has given them a vision of an ultimate good, an ultimate reconciliation, when God shall be all in all. Accepting gratefully the new and nobler demonstration of God's eternal power and majesty, which science gives, they offer in return the healing and completing faith that God is life and light and love. And to this completed conception of God there corresponds a nobler conception of man, which is full of hope. If man is imperfectly what Jesus was perfectly, the son of God, then he may not only reverence the power of God and worship his majesty, but also rejoice in the life which comes from above, and walk in the light and reciprocate the love, of his Father in heaven.